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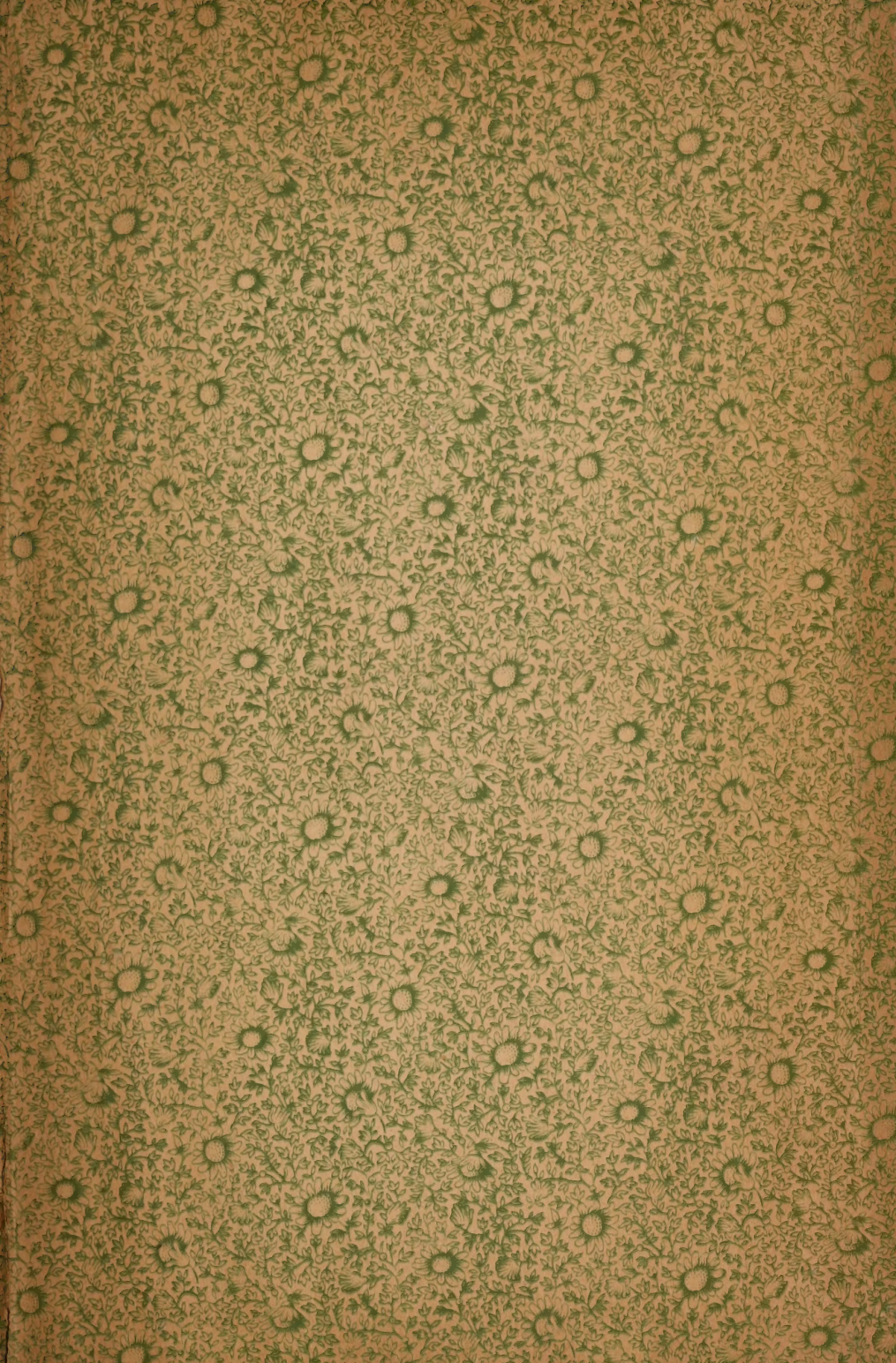
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# THE DENTAL REVIEW.

DEVOTED TO THE ADVANCEMENT OF  
DENTAL SCIENCE.

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*VOL. IV.*

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CHICAGO:

PUBLISHED BY H. D. JUSTI FOR THE DENTAL REVIEW CO,  
66 MADISON STREET.

1890.



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# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, JANUARY 15, 1890.

No. 1.

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## ORIGINAL COMMUNICATIONS.

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### LOOKING FORWARD.

DENTISTRY IN THE YEAR 2000—THE COLLEGE SYSTEM—THE EVOLUTION OF THE DENTAL PROTECTIVE ASSOCIATION, AND THE STATUS OF THE AMERICAN DENTAL TRADE ASSOCIATION—THE REPRESENTATIVE DENTAL JOURNAL—PROGRESS IN METHODS.

Dreamers of all ages have been ridiculed, and yet it is to these men of imagination that much of the progress of the world is due. The prophecy that a thing will be, not infrequently is the initial impetus toward accomplishment, and the prophet is credited with prevision, whereas his dream would not have been realized if he had not related it.

For this reason I shall give you in detail a remarkable vision of the future of our profession, which has been my dream.

The old year was dying; a new one was approaching. I was lying down, meaning to rest rather than to sleep. Thought, which bridges time, carried me hurriedly over the past of my professional career. Brief though it was, I could mark many distinct landmarks of progress. With the dawning of the new year I not unnaturally speculated as to the future. I "looked forward."

I have no recollection of having fallen asleep, but suddenly it seemed to me that I was on a train of cars. Whither bound I knew not, nor did I seem to care. I became aware of the fact that I was among strangers. This I did not note at first, because one does not expect to meet acquaintances on a train; it was made noticeable when I observed that the other men were chatting together as though well acquainted with each other. I listened to the conversation of those nearest to me, and was surprised to find "Dentistry" the topic. One man was saying:

"Yes, I think I shall surprise the convention to-morrow. I shall show what I believe to be a veritable case of *Pyorrhœa alveo-*

laris, as the disease was known and described in the journals of a hundred years ago. There has not been a genuine case reported in thirty years, you know."

Could I be hearing aright? Pyorrhœa not known for thirty years? Then surely—— but the next words which reached me fairly startled me :

"Yes, Doctor; undoubtedly your case will prove most interesting. The last case that I know of was that shown by Dr. Richards in 1962, nearly forty years ago."

I could withhold speech no longer. Turning, I addressed the men behind me :

"Pardon me, gentlemen; but will you give me the date?"

"May first."

"And the year?"

"2,000."

"2,000! You are quite sure?"

"Why, of course. What is the matter with you, Raymond? Are you out of your reckoning?"

"Raymond! Is that my name?"

"Why, Doctor, do you not know yourself? Is any thing wrong?"

"Let me think a moment," said I. I was confused. I thought it the year 1890, and these gentlemen declared it to be 2000. I thought my name Ottolengui, and heard myself called Raymond. I pondered deeply, and then spoke :

"Gentlemen, there is a mystery which I can solve but in one way. The Theosophists claim that man lives many lives on this earth in succession, but is ever oblivious of the past. It seems otherwise with me. You know me, and yet I know you not. You tell me it is the year 2000; to me it seems to be the year 1890. If you are correct, then by some mental trick my present has become obscured, and I am conscious only of an existence long since past. Singularly enough I seem to have been a dentist then as now. I could enlighten you of what to you must seem to be the past, but which to me is as the present."

The two men looked at each other amazed, and then spoke in whispers. I caught the words :

"It will be best to humor him."

"Will you tell me your names?" said I.

"Mine is Harriman, and this is Dr. Ashland, the President of the University."

"The University!" said I. "What University?"

"The National Dental University."

"There was none in my time. We were satisfied with simple colleges."

"You are wrong, Doctor, in your time, since you insist that you do not recognize the present; the profession was not satisfied with the colleges. The University system has grown naturally out of that feeling of dissatisfaction. But Dr. Ashland can tell you about it in detail."

"The facts are thus," began Dr. Ashland. "At first when dentistry was not recognized as a science, and the practitioner was an artisan with secret methods, the student was practically an apprentice, and learned of a master. Slowly it dawned upon the people that in the New World, America, a *new* and distinctive profession was to be born and thrive. The sphere of the dentist widened and he took a course of lectures in some medical school. Next the purely dental school was inaugurated, and in a brief period of years could be found at least one such institution in each large State."

"Yes," said I, "I can remember that there were a large number of colleges and considerable competition between them. The number of graduates was enormous."

"Exactly. There was great competition. There were too many schools, and the result was that men were graduated who were not sufficiently qualified. The colleges were forced to do this that they might attract students. Finally the several States began to protect themselves with prohibitory laws. State Boards of Examiners were created with power to confer degrees and to control the practice of dentistry in their localities. Massachusetts even made it compulsory for a man to obtain her special degree. It was obnoxious for a man graduated by a college to be compelled to submit to a second examination before he was allowed to practice. Yet the law was meant to force a higher standard on the colleges. Thus degrees were multiplied and each State had a separate dental law. In the United States Congress, which met in 1924, a new era dawned. At last it was seen that the sovereignty of the States on certain questions, was a menace to the integrity of the Union as a nation. Amendments to the constitution were recommended and finally adopted, which enacted national laws on many questions, and repealed the existing State laws. The most



important of these laws were in relation to Marriage and Divorce. There was a number of others, and among these were laws regulating the practice of Medicine and Dentistry."

"You mean that there is now a National law regulating the practice of Dentistry?"

"Exactly. It is brief and effective. No man may practice in the United States unless he holds the degree conferred by the National University. That is D. O. S.—Doctor of Oral Surgery. It was deemed advisable to make the degree a new one, that the law could better be enforced."

"But," said I, "Since there can be but one University, it seems unjust to compel attendance from distant localities?"

"You do not grasp the idea. The colleges continue to exist as heretofore. They are the schools. A student attends a course covering three full years. If he passes the examination at his College a certificate is accorded to him which entitles him to attend the University examination."

"He is not admitted at once, then?"

"Of course not. In that case the standard of excellence in the college could not be controlled. No, he must be examined before entering the University. If he passes he attends a course of lectures covering six weeks, and is then examined for his degree."

"There is still the objection which I raised. The student from a distance is not on an equality with those living near by."

"The certificate granted by the college entitles the student to free passage by rail and return, to and from, the University town. Of course this is simple since the Government bought out and controls all railroads."

"Suppose that a man does not pass either of these examinations."

In either case he is returned to the college. And as the college was evidently at fault in granting its certificate to an incompetent man, it is compulsory on them to receive him for a fourth term without fee. This is a further incentive to make the colleges strict."

"The system seems an admirable one. It is odd that it did not occur to those in my time."

"Evolution, my dear doctor, evolution. That is the grand law of all progress. Perfection is aimed at throughout all stages in the ascent. It is not correct to say 'This was not thought of,' 'That was not conceived.' The highest attainment can be traced back to

the smallest beginnings. Each detail was a necessary step. 'Look for instance at the Dental Protective Association.' Possibly its founders would have been horrified if told that their association would ever become a 'patent agency.' Yet so it is."

"The Dental Protective Association a Patent Agency? Impossible!"

"There again is evolution. It appeared that the association was formed to fight patents, but truly the object was to protect the Dentist in his interest in patentable inventions relating to his profession. At first the managers of the enterprise expended their time, money and energy in the battle against the company which controlled a number of patents. But little was effected. Litigation is tedious. The enactments of one court were overturned in another. They won a suit only to find it again on their hands. The end however was inevitable. Time would after all defeat the patent holders. And time was all that did crush them. When this point was reached the association awakened to the fact that if the fighting of patents was its object, it would no longer live, since there were no more patents to wage war against."

"What did they do then?"

"What they should have done from the beginning. They announced that they would become a market for dental patents. They would buy all which the Trade Association would recommend."

"Then they had some connection with that body?"

"I will explain that in a moment. In your day the great bug-a-boo was the ethical point that a professional man could not hold a patent. This narrow-minded view more than anything else made it possible for companies to be formed which would buy patents and levy a tax on the profession at large. When the Protective Association announced that they would buy patents and hold them for the general good of the profession, the question was solved. Men were stimulated toward invention because of the certainty of reaping some pecuniary reward in proportion to their works."

"But how could the society buy patents? What would they do with them?"

"Before I can reply to that question, I must explain the position now held by the Dental Trade Association. About the year 1890 that association attracted considerable attention. The Dentists in many sections, claimed that it was a gigantic trust organ-

ized so that the prices of goods might be kept to the highest point. On the other hand, the trade people claimed that they simply co-operated for mutual advantage, and that the Dentist gained because the standard of excellence in manufacture was thus kept at a high notch. These two claims were continually set forth by each side, and a long wrangle was kept up, until the Protective Association announced its new departure, after having received the concurrence of all concerned. Once, annually, there is a convention attended by the Protective Association and the Trade Association. The delegates to this convention comprise one Dental delegate to every one hundred Dentists who are members of societies, and one trade delegate for every one thousand dollars invested capital."

"What is the object of this convention? And why is it that the Dentists who are not in societies have no voice?"

"As to the latter question the reply is manifest; the object is to force the dentists into the societies. This is only just. The dental delegates alluded to, comprise the Dental Protective Association which is thus thoroughly representative. Capital is necessary to conduct the business of the association, therefore each delegate is obliged to pay \$100 into the treasury of the association, which, you observe, is a tax of one dollar per year on each dentist represented. It is computed that there are twenty-two thousand dentists in the States to-day, and as this year, twenty thousand dollars was paid into the treasury of the association, you see that the majority of the men are in societies. This alone is a great advance over your day, when the society men were a small minority."

"Undoubtedly. But, Doctor, is not twenty thousand dollars a small capital to buy patents with?"

"That is not an unnatural question, but the fact is, the association loses but very little on its patents; nothing in fact. This brings us to your other question, the object of the joint convention of dentists and manufacturers. At this grand meeting reports of all kinds are received. Working with a full knowledge thus obtained, the first thing done is to arrange a schedule of prices for the ensuing year."

"Do you mean to say that the dentist now has a say in the price of dental goods?"

"Assuredly. Is he not as much interested as the producer? The subject is thoroughly canvassed and the prices fixed."

"But suppose that the dental delegates should be in the major-



ity and should fix the price so low that the manufacturers could not make a profit?"

"The dental delegates usually are in the majority, but they could not enact so arbitrarily, for the simple reason that as soon as too low a figure is placed on any special article, the manufacturers refuse to produce it. This is the salvation of the small dealers. There are many things placed so low that it would not pay for all the dealers to handle the article. Certain ones, therefore, declare that they will not enter into the competition on that line, when at once it becomes possible for a few dealers to make a profit by thus obtaining a sort of monopoly, even though the price is fixed by the convention.

"How do you compel the manufacturers to meet a required standard? Why could they not accept the price fixed by the convention and then supply an inferior article?"

"If such a thing could be proven the offending dealer could be expelled. But it is not probable. Wherever it is possible to have two or more grades in any product, prices are fixed for each grade. Thus there would be no temptation to make an inferior article, since it would at once come under a lower price. But now let me explain about the patents. All patents are presented to the convention, and submitted to a committee of dealers. This committee reports on the probable demand for the new articles, the price at which they could be sold, and the royalty which the dealer would be willing to pay. On this basis a value is fixed for each patent, and that amount in cash is offered to the holder of the patent, who must in all cases be the inventor himself. If accepted, the patent passes to the Protective Association, who collects royalties from the dealers until the amount advanced has been recovered, with twenty per cent additional. As soon as this is accomplished the amount of the royalty is removed from the price of the article. Thus, you observe, that in the end the inventor is paid by the exact individuals who first use his invention. The dealer makes as much profit at the reduced price as before, the Protective Association merely advances the money.

"Suppose the inventor does not accept the offer, and sells his patent to one of the dealers?"

"In the first place, under the laws of the Trade Association, the buying of patents is prohibited. But, apart from that, no dealer will buy a patent when he cannot himself fix the price at which the

article must be sold. No, the only course open to the inventor would be to manufacture his article himself. Then, if he wished it sold by the Association dealers, he must submit to the rule of price as explained. Most men would prefer the certain cash."

"Since everything is so changed, tell me how are the journals conducted?"

"Properly speaking there is but one journal. There was much talk in your day against what was termed the "trade journals," but it was noticeable that the trade journals had the largest circulations. The reason was that the readers were as much interested in the development of instruments as they were in the advancement of methods of practice. They as often read the advertisements as the other articles. To-day, therefore, the journalism of the profession is admirably systematized. Each State Society publishes the transactions of its meetings, and those of the local societies. These appear every quarter, the publication months being different in different States. There is but one general journal, which is managed jointly by the Protective Association and the Trade Association, profits or losses being equally divided. All dentists who are members of societies are compelled to subscribe, the price being two dollars per year. To men not members of societies the subscription price is double. All advertisements are paid for by the dealers. The journal publishes the best articles which appear in the society transactions. In this way the same thing is not told in a dozen ways, but the reader gets the kernel of wheat sifted from the mass of chaff. Besides, there are special articles written for the journal by the brilliant minds in the profession."

"Doctor, you have told me how the Protective Association buys patents. I suppose the twenty per cent profit on some is supposed to cover the loss on others. This being balanced, then what does it do with its money?"

"Besides meeting the current expenses of the Association, it offers awards to men who discover valuable facts in dental science, or who otherwise contribute to the general welfare of the profession in any shape where patent or copyrights do not offer a pecuniary return. It pays clinicians to make the circuit of the large cities and the colleges, and in various ways uses its capital for the advancement of the dental science."

"I suppose there have been some changes in methods. I



heard you say that Pyorrhœa is now very rare. In my time it was very common."

"Yes, but that is all changed. The advance made in Bacteriology early in this century made it evident that there was but one radical cure for so-called constitutional diseases, and that was extermination."

"And have you accomplished that?"

"Not entirely, but we have made great progress. It was done in this way. When the National marriage law was passed, it provided that no one known to be affected with a constitutional disease should be granted a marriage license. All applicants, therefore, were compelled to pass a physical examination. That the law might not be too rigid at first, only a few of the worst diseases were placed on the list, such as Scrofula, Leprosy and Syphilis. Later Consumption and mental diseases were added, and from time to time the list was extended, until now, in the third generation since the passage of the law, we begin to recognize the wisdom of our forefathers. Naturally Pyorrhœa is not so prevalent."

"Do you still fill teeth with gold, or have you found something better?"

"That problem was solved by Erickson. About thirty years ago he offered, at one of the conventions, a plastic material, which could be softened by heat and inserted as you did gutta-percha. It became about as hard as bone, and would receive a polish. It was adopted after thorough trial, and now, after thirty years, has proven to be the ideal filling material. It is manufactured now in a more excellent form than that made by Erickson, but is substantially the same. It is made in all shades, so that the teeth can be matched very accurately in color."

"Of what is it made?"

"The original formula of Erickson has been somewhat changed, but the principal ingredients remain the same. They are——"

At this moment there was a tremendous crash. People were thrown from their seats. I made a desperate effort to save myself, but——fell out of bed, wildly gripping the bed-clothing. The shock awoke me.

RODRIGUES OTTOLENGUI.

115 Madison Avenue, N. Y., January 1st, 1890.

P. S.—Of course the above is suggested by Bellamy's book.

R. O.

SOME OF THE SURGICAL ASPECTS OF "RIGGS' DISEASE"—"PYORRHŒA ALVEOLARIS"—"PHAGADENIC PERICEMENTITIS."\*

By GARRETT NEWKIRK, M. D., CHICAGO, ILL.

It perhaps matters little what name we use in referring to any specific form of disease, if only we may understand its true character and rational treatment. Results are of greater importance than definitions. Still, there is a benefit in having names definitive as far as possible. A false name is misleading, and a very imperfect one unsatisfactory.

A name given to honor the man who has been the first to describe or excite general attention to a special affection is certainly better than no name at all, and better than one which aims to be scientific but is not.

The term "*Pyorrhæa Alveolaris*" has reference to one symptom or result of the disease we are studying to-night, but conveys no hint of its true pathological character.

"*Phagadenic Pericementitis*" is perhaps a better term than the other, because it means more. It describes correctly at least one of the conditions attendant on every case; but when early in the progress of the disease the pericemental tissues have been destroyed except at the edges of a given tract, it is not wholly definitive. Inflammation simply of the pericementum, or of the periosteum, is no longer the prime factor of disease, though we may admit for argument that it has been the original cause.

Now, it seems to me that the action of the cells of the part is rather in the line of resistance to and limitation of the destruction of tissue, which is the characteristic feature of the disease. I doubt if, in its essential nature, it is any more inflammatory than caries of the teeth, and I believe that when once established beyond the line of the periodontal membrane Riggs' disease is a true caries of the alveolus, differing in nowise essentially from caries elsewhere. It is simply modified, both in its inception and progress, by the peculiar position and relations of that body.

What is caries? Nothing more nor less than ulceration of bone. Bone is subject to the same diseases as other tissues, but these are modified by the location and density of the structure involved. Hence, Dr. Ingersoll has very properly termed the so-called Riggs' disease alveolar ulceration. Dr. Harlan favors the term Infectious Alveolitis, proposed by Dr. A. Witzel, and this is also a better term

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\* Read before the Odontological Society of Chicago.



than any of those more commonly in vogue. But, if it be a strictly correct one, it is just as well to say of caries anywhere that it is infectious osteitis.

The seat of caries, as we know, is almost exclusively spongy bone. It is scarcely known elsewhere, except secondarily. Its progress is slow. As in ulceration elsewhere, tissue is broken down particle by particle. The active cause is not from within, but without. The enemy, whatever it may be, is foreign and aggressive. The cells of the part assist, but are slowly overcome.

It is true the enemy feeds upon conquered territory, and probably turns the elements of the tissues destroyed against those which next resist. But this is in accordance with the laws of war. Our treatment of the disease is simply war with this enemy. If his way of retreat is not free we must make him a road, and our medicines are to drive out and destroy him.

Pus is the medium through which nature strives to expel him by sinuses; otherwise it is used by him to conquer other fluids and hide in the caves and ravines of the cancellated tissue. With your permission I will recite a practical illustration :

In the year 1855 a young woman, living in Missouri, received a bruise upon the foot by falling from a horse. A swelling ensued over one or more of the short bones of the instep. Instead of prompt treatment given by the knife, poultices were applied till a portion of the periosteum was destroyed, and a fistulous opening followed. I saw her seventeen years after. All the bones of the foot posterior to the phalanges, with the lower end of the tibia, had been honey-combed by caries.

There were fourteen external sinuses about the instep and sides of the foot. A probe could be passed through one to another, transfixing the member without pain. It was practically dead from heel to toe. The muscles had all undergone fatty degeneration, or shrunk to semi-tendonous cords.

There was practically no circulation except in the skin and toes, and there very weak. The limb had been entirely useless for three or four years. I amputated the leg about six inches below the knee, and was fortunate in finding healthy bone. The anterior and posterior tibial arteries were so small as to scarcely need ligation.

The foot, longitudinally divided, to show the condition of the astragalus and os calcis, is now in the museum of the Chicago College of Dental Surgery.

Here was a case where it took seventeen years to nearly destroy a member by caries. The enemy obtained a narrow hold beneath the periosteum from which he advanced, we can scarcely say step by step, but rather by molecular stages.

Should we call this case pyorrhœa pedis, or phagadenic periostitis?

There is no doubt whatever that in the earlier years of this case if a free opening had been made by proper instruments into the infected territory, and the enemy attacked mechanically and medicinally in his lurking places among the cancellous tissues, nature with such assistance would have saved the member to usefulness. That there was no fault of constitution in the case, was shown by the recovery of the patient from amputation after years of suffering, and at the last more or less blood poisoning. She was alive and well at the age of 60, a few months ago.

For several reasons it would seem that the alveolar processes might be easily liable to caries. They are permeated in a "full" mouth by from nineteen to twenty-four openings, or cells, for the roots of teeth. Around each root, and lining each cell, there is a membrane of complicated structure, liable, from several causes, to be the seat of inflammation. Around each tooth, likewise, there is a gum margin, beneath which infectious agents may easily be insinuated.

Furthermore, the fluids of the mouth are a most convenient media for the diffusion of infection. In relation to no other bone or process of bone are the conditions anything like so favorable to the beginnings of ulceration. Nowhere else is surgery called upon to arrest and cure caries and at the same time preserve other organs of different structure permeating and reaching through the diseased territory. This is where the trouble comes in with successful treatment. Remove this unusual and complicating element, the tooth, in any given case of alveolar caries, and treatment is reduced to simplicity itself.

Whenever the living relationship between the tooth and the bone is severed, the member becomes just so far foreign to the body. The problem before us is therefore enlarged to comprehend the re-establishment of friendly relations between disaffected tissues, and to bring about, if possible, a reproduction of supporting and friendly bone. The marvel is not that with our present knowledge we fail so often, but that we should succeed at all.

It is not my purpose in this paper to discuss the *medical* treatment of the affection, because this has been thoroughly studied and presented by others; notably Drs. Black and Harlan. The latter has the honor of having been the first, I believe, to suggest the use of that incomparable agent, the peroxide of hydrogen. I will only say that, in my own practice, the remedies are usually few and simple. The peroxide is my chief dependence primarily, and after that the essential oils, with occasionally iodine. I use no coagulants, and seldom escharotics. Where some might seek to burn chemically, I would prefer to remove mechanically, and it is on this line—that of operative procedures—I would say a few things to-night.

If the principles of surgery have ever been applied by a few to the treatment of alveolar caries as rigidly as they are to caries elsewhere, they certainly have not been either appreciated or applied by the vast majority, including some who have written upon the subject.

First, drainage.

In every case where considerable destruction has taken place there is an area of doubtful territory—*i. e.*, tissue of more or less irregular surface, of low vitality or none, but not yet broken down. It is a barrier to medication and to healthful cell action, and a refuge of the enemy. It is sound practice to remove this, particularly where purely medical treatment has been tried without success.

To do this, however, and to treat medicinally to the best advantage it is necessary to have a free external opening of access, for the unimpeded use of instruments and for drainage. By Dr. Black and others, much stress has been laid on preservation of soft tissues about the necks of teeth, especially the gingival continuity of the gums. It has been said that this should be preserved at all hazards for fear if once broken it would not be restored.

This idea I believe to be erroneous, and a stumbling-block in the way of success: First, because it often happens that about teeth, those with single roots, the gums adhere so closely, assisted perhaps by tenacious mucus or a line of blood-clot as to shut the door against free drainage.

Second, *depletion*.

They are nearly always the seat of passive congestion. Their appearance indicates a sluggish circulation in the parts adjacent to diseased tissue.



Vital action and powers of resistance have been lowered in them all. They seem to have been overawed, so to speak, and intimidated by the enemy. They are ready to weep blood with slight irritation. There is diminished tissue change and cellular activity.

The less stimulus and the shortest way to healthy action is by division of all constricting bands and excision of superfluous tissue, which give at the same time local depletion and drainage.

I doubt if any benefit is to be expected from preserving so carefully an unbroken continuity of swollen gum tissue over carious caverns in the alveoli. I cannot see as we are to cleanse the sepalulcher any better by keeping it covered.

If not removed or diminished by the knife, and by possibility the diseased alveolar surface beneath is restored to health, the soft tissues must eventually contract or thicken. The last mentioned they will not do often; so that in the end we will lose nothing by judicious excision except the ideal contour of the gum at the gingival margin. Furthermore, I would say that if the carious tract were high up, not reaching to the external wall beneath the gum, and no free opening thereunto, I would make a road sufficient for drainage through both soft and hard tissues. I have seen prompt cures result from such treatment in cases that had before seemed almost hopeless. I have observed a marked change in the action of the parts. Teeth that had been loose have in a short time become firm, and apparently the bone has been reproduced about the roots. But I have never seen a case where the original contour of the gum has been restored after extensive loss of the alveolar wall. I have in mind several instances where the teeth formerly very loose, are now held firmly by the upper two-thirds or half of their roots with the gums and alveoli in healthy condition; and these are results we may well consider satisfactory.

We see cases wherein one or more fistulous openings have been established as a consequence evidently of the close adherence of the gum about the necks of the teeth. Perhaps but one has been involved, usually a front tooth, oftener below. On examination it will generally be found that all the alveolar wall has been destroyed to or beyond the sinus. In my judgment there is but one thing to do in a case of this sort: Cut freely between, cleanse the root of deposits, bur out any softened bone and be satisfied with the result in the end of a shrunken wall and partially exposed root. We

must dispense with the ideal, take what we can get and be thankful for it.

Some three years ago I had a case in hand where there was extensive caries of the palatine wall over and between the left lateral incisor, cuspid and first bicuspid teeth—subject, a man of about 35. I had difficulty in securing drainage by ordinary incisions. The general surface being concave, the tissues would at once collapse and close the opening with the result again and again of the retention of a teaspoonful or more of pus. As you know it is the region of the rugæ—where the soft tissues are thick and tend to pucker. In this instance, too, they were exceedingly tough and leathery. At last I bethought me to make a large circular opening, and as a convenient instrument, one of Dr. Call's aluminum cups (a root trimmer), seemed to be well adapted.\* Through the opening thus made I was able to introduce a large engine bur† and remove a considerable amount of diseased bone, mostly from between the roots of the lateral and cuspid.

The patient was given a glass syringe with a large curved nozzle—(an ear syringe, one with a shoulder) and directed to use daily, both for keeping the opening free and the injection of a disinfectant liquid. I saw him twice a week only; sounded for healthy granulations which had begun at once to fill the cavity from the bottom, and of course I used as I had from the beginning, the  $H_2O_2$ . Within three weeks the external opening was ready to heal over healthy tissue as it is to this day, and the teeth are firm.

In the lower jaw, I have found it necessary as it seemed to me in one instance, to remove the first molar teeth, for drainage. The process was more or less carious through its whole length, except about the third molars, but almost completely destroyed in the region of the first molars, and it seemed impossible to secure drainage without their removal.

As I doubted my ability to save them in any event, and the man had a "full mouth," I extracted.

By this operation a very discouraging case was converted into a hopeful one, now almost cured. I may say the upper alveolus was

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\* In using this it is necessary to make a small opening in the base next the mandrel for exit of air.

† We often need much larger burs in these cases than are kept in stock at the dental depots. White's or others make them only on special order, but every dentist should have one or more.

in quite as bad a condition as the lower, but with gravitation in our favor, no extractions were necessary.

The removal of accretions from the roots of teeth, whether of salivary, serous or sanguinary origin, has been spoken of with emphasis by all the leading writers on this subject.

Its real importance has not been overestimated perhaps by any; but I am inclined to think its *comparative* importance has been.

As dentists, we have thought more of the teeth which often are but incidental factors, and less than we should about the bone, which is the true seat of the disease.

*Salivary* calculus should always be removed. Thin deposits of the other sorts, especially the sanguinary, high up on the delicate roots of loose teeth, as they often are, we cannot be certain of completely removing; nor am I sure that with the thoroughly antiseptic treatment we all employ, it is at all necessary. I am sure that as much harm as good has been done by the average operator who has attempted this extremely delicate task, not taking into account at all the feelings of the patient, who is incidentally present.

In this connection I wish to say something about instruments and methods.

I admire very much the delicate chisel scalers of the forms suggested by Dr. Harlan and those similar by Dr. Allport; I am greatly indebted to these gentlemen, also to Dr. Cushing, for ideas that have guided me in making instruments for myself.

But there are, to my mind, objectionable features in the chisel scaler for use on roots, especially if the operator be not a most steady handed expert. The motion of the instrument is toward the apex of the root. The surface grows narrower in the direction of force. The blade must be very narrow indeed, even when applied exactly, if the corners do not run off. Take a freshly extracted tooth, put it in a vise, or better, hold it in pliers by one hand while you attempt to scale the root with a chisel in the other, and it will help you to realize how nearly impossible it is to perform the operation satisfactorily. It is far from being the simple and easy process one would suppose from the off-hand, free and easy methods of speech that have been associated with it.

The operation is particularly difficult when it is attempted to work through a close crack between the gingiva and neck of a tooth. This, and the attempt afterward to remove the debris from



a large pocket, is a little like trying to sweep a room by sticking a broom through the transom of a door. Free incision, or often needed *ex-cision*, will greatly simplify the work and leave drainage.

For myself, I usually prefer the "*hook*" instrument and "*pull*" motion for the removal of root deposits, for the following reasons: My tactile sense indicates when the edge has passed the upper border of the deposit, and I am not in danger of sending it unintentionally beyond. Force is exercised outward, toward the widening instead of the narrowing surface. The deposit removed comes down with the instrument, instead of being pushed upward or aside.

I have here some instruments in which you will notice two peculiarities. The "*chisel*" scalers have slightly concave edges, with rounded corners. They are not to be sharpened on a whetstone or any flat surface, but by a narrow wheel with the engine. The "*hooks*" are rounded and perfectly smooth to the "*push*," so they may pass like probes anywhere without wounding, while, like probes, they "*feel*" for foreign substances.

For the removal of fine particles of debris from deep-seated pockets, I do not like to depend entirely on the syringe, no matter how free the opening. A blunt-pointed, medium to coarse jeweler's broach, wrapped with cotton, this moistened with some essential oil, with me is a necessary adjunct.

#### REST.

Writers have not failed to impress the importance of this principle as applicable to loose teeth, in that they should be supported and held by attachment to those adjoining. I can say no more than Dr. Harlan has said long ago on this point, except to speak of a method with which my experience has been particularly favorable in supporting lower incisors. It is not new nor original with me. Dr. Nichols, I think, brought it to our attention some six years ago, at a meeting of the city society. For some reason it has not been so generally applied as its merits would warrant. I refer to gold bands soldered together. I remember that when this was first presented to my attention the task seemed quite difficult, and I continued for some time to use wire and ligatures, because I rather dreaded to undertake it. But it is quite a simple thing to do, and a joy when completed.

I take narrow strips of thin gold, about gauge 30 to 32, and pinch them about the teeth with small pliers, just where I want

them, far enough from the gums so that a narrow scaler may be passed beneath when necessary for the removal of tartar. To make sure that none of the bands exchange places and so get onto the wrong teeth, I have a little block in which are driven a row of common pins. The unsoldered bands are placed in order on these, taken off soldered, and replaced one by one. The soldering process is best accomplished by holding them with delicate pliers over a small gas-jet or spirit lamp, and before cutting off the projecting ends of the gold.



Method of Pinching the Gold Splints.

Should the incisors come very close together at their corners, these must be rounded and separated enough to permit the double thickness of gold to pass when the bands shall have been fastened together. The bands are then placed on the teeth nearly to place, but not quite, lest there should be difficulty in removing them without injury. An impression is then taken in modeling compound, and the bands removed and placed in the impression. Plaster and marble dust are mixed and poured, and plenty of time given for thorough setting. On removing the compound, we have the bands in precisely the relative positions desired, and a little solder fastens them together on their lingual aspect. The solder should not flow far into their approximal surfaces, for the reason that it will interfere with an accommodation to be presently mentioned.

Now apply the rubber dam to all the teeth concerned, and one more on each side. You know the appliance must fit, because it has been there, less the connecting links. Now, to place it on, the bands must be pinched together somewhat antero-posteriorly, so that their lateral surfaces meet closely, to enable them to pass the corners. Then the pliable bands readjust their diameters, as they are tapped lightly to place. Of course the teeth should be thoroughly clean and dry, (I usually rub them with a little pumice,) and the bands should be lined with very thin, slow-setting cement. To place this appliance properly under the heading of the paper, we may call it "*Gold Splints.*"

In one instance I have kept some lower incisors in place about

four years, whose roots were but slightly attached by their upper thirds. The looseness of the teeth had caused continual annoyance, and the patient has been correspondingly grateful for the relief and comfort since experienced.

There is one other matter of which I wish to speak—that of partial plates, as bearing a causative relation to alveolar absorption, and as I believe sometimes to caries. Those of rubber are especially apt to be fitted closely to certain of the teeth, with sharp points reaching in between.

These are thought to be necessary for the retention of the plate, and yet they can hardly fail to be injurious in every case. I think I heard Dr. Cushing once say that whenever a few teeth were once replaced with a partial plate it would only be a question of time as to the loss of the others, one by one. It is practically out of the question to treat alveolar disease with any assurance of success where such a plate is worn. Unless it may be discarded or a very different one substituted, we may as well extract at once, and so drain the part affected.

The certainty that much of the bridge work made and recommended nowadays will produce like results with the alveolus is unquestionable.

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### THE DENTAL PROFESSION.\*

BY DR. E. NOYES.

It is the usual fashion for essayists to glorify the dental profession of the present by reference to the time, more or less remote, when dentists traveled about the country and joined to the occupation of a tin peddler and general tinker and mender, the extraction of teeth and insertion of artificial ones, and the filling of such cavities in teeth as could be done easily; but I wish to remind you that those old times are not fairly represented by any such talk. No, my friends! "There were giants in those days," and the men who were wise and far-seeing and patriotic enough to originate the dental colleges and dental societies, and to establish the dental journals, are entitled to our everlasting gratitude, as the authors of the "profession" of dentistry, and their work set in motion the forces and influences to which we owe most of the progress that has been made since their time. Many of those pioneers were gradu-

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\* Read before the Odontographic Society of Chicago.



ates in medicine, and were liberally educated besides, for it was more common then than now for men to complete a college course and obtain the degree of Bachelor of Arts before studying medicine. The metal work of that day, and the comparatively small number and crude forms of the instruments and appliances furnished by the dental depots made it necessary that dentists should be ingenious and well-trained mechanics. To be sure that has always been equally desirable ever since, but when the introduction of rubber cheapened prices of artificial teeth so much as to make a hundred thousand people, more or less, think they could afford to have them who had previously done without, there came a time when all the dentists of the country were very busy making rubber sets, almost to the exclusion of operations on the natural teeth, and it became possible to learn in a few months how to make some sort of a set of teeth on a rubber base, and to be profitably busy at once without taking the trouble to acquire any professional education worthy the name. In this way rubber, which has undoubtedly been of great value to both the public and the profession, served incidentally to lower the standard of professional character and attainments for a time. The danger was quickly recognized by the older and better men, and they began crowding every student they possibly could into the dental colleges, and in every way urging the need of thorough preparation for practice. They began also to magnify the department of operative dentistry, and to oppose with all their might the craze which spread over the country for extracting natural teeth and substituting cheap rubber sets. These efforts have been so far successful that there are now comparatively few intelligent people who really think a set of artificial teeth to be *very* much better than natural ones. Lately the experience which has served to show the limitations and disadvantages, as well as the value and uses of rubber, together with the introduction of all the various forms of crown and bridge work, have brought us to a time when it has again become necessary for dentists to be skillful metal-workers. Rather I should say, that although it was always necessary, a great number of dentists could not be convinced of it until they became obliged to do crown and bridge work and make partial gold plates, in order to keep pace with the march of events.

At the present time the dental manufacturers and dealers are anxious to supply us with an abundance and variety of furniture, instruments, machinery and apparatus for every detail of practice,

wholly undreamed of by our predecessors, and quite sufficient to relieve the ordinary practitioner from the necessity of making his own tools and instruments, though some men still find it possible to make a few things that please them better than any that they can buy, and the variety of delicate machinery that we now use makes it very desirable that all should understand the details of construction and operation sufficiently to take proper care of machinery and keep it in better running order than is sometimes the case.

In all respects the dental profession of to-day stands before a wide open door of opportunity which was in part closed to our fathers. In addition to the wonderful equipment just referred to, of instruments, appliances and ready-prepared material for every possible operation and construction that may be required, we have a knowledge of the pathology and therapeutics, and a record of experience in treatment of the various diseases and conditions ordinarily committed to our care that had not been attained fifty years ago, and which have greatly enlarged the range of practice and increased the usefulness of the profession. There is still abundant opportunity for original study, investigation and discovery, with the prospect of equal rewards in practical results, to stimulate the ambition of the studious and educated men in our ranks.

The public have awakened to the need of dental services and the benefits resulting from them to a far greater extent than formerly, so that dentists are not so often obliged to explain and insist, and promise results in order to gain consent or inspire confidence.

It is easy to see that to fulfill these requirements and enter this open door of opportunity requires strength and rectitude of character and conduct, minds trained to vigor of thought and accuracy of judgment, well stored with the knowledge of arts and sciences relating to all departments of practice, and manual dexterity, skill and experience in the performance of all operations and constructions required. What is the standing of the dental profession at the present and its prospects for the future in respect to the fulfillment of these reasonable requirements and expectations? Is it such that "We can point with pride," etc., etc., and indulge in the pleasant task of eulogy and self-congratulation, or do we fall below a reasonable standard to a degree that calls for some regret and mortification, and is the prospect for the immediate future such as to excite reasonable alarm and call for the careful study and best ef-

forts of all good men to find a remedy for existing evils, and avert impending dangers ?

An editorial in the December *Cosmos*, is so much to my purpose that I will risk quoting it, notwithstanding the probability that you have all read it :

“A reprint of the Yale University address on medicine, by Professor H. C. Wood, of the University of Pennsylvania, we present the following extracts :

‘The American medical profession has in it a multitude of rightly educated physicians, but it comprises also an enormous number who are but partially educated in their profession. Of all places in the universe, in America there are doctors and doctors.

‘The American medical profession cannot be in any degree held responsible for its condition, not merely because it has no power over its own members after they have entered, but especially because it has no control over the gates through which men flock into it. In some States the law allows any one to set up as a doctor who wishes ; while where there is any law regulating the mode of entrance into the profession, such law usually puts the power of granting the right to practice into the hands of the medical college. To be sure the medical college is nominally required to examine the candidates, and to shut out the unfit. Almost any small group of physicians can, however, constitute themselves a medical school, and conduct their examinations so privately that no outsiders can know whether these trials be substance or shadow. The national vice, the imperative desire to get on in the immediate present, fills the land with persons who wish to get the right to practice medicine at the lowest outlay in money, time and labor. For these candidates the schools bid one against the other ; and so the standard falls lower and lower, medical education becomes a farce, and the doors of entrance to practice stand wide open to any one who can raise a few hundred dollars.

‘At the recent examination for the Army Board, of thirty doctors who had been picked out from among the best graduates, and had been especially prepared for the army examination, only two reached the required standard. I believe myself that not twenty per cent of the graduates of medicine in America could pass the State examination required in Germany for license to practice. Humiliating though it be, yet it is true that an American medical diploma has in itself no meaning, and that it will never be a true



certificate of technical knowledge and education until it is supplemented by the law.

‘If such language can be appropriately used with reference to the medical profession, medical colleges, medical examinations, and medical diplomas, it suggests if it be not worth while for all concerned—practitioners, professors, students—to inquire how far it is applicable to existing facts in similar dental relations. ‘The national vice, the imperative desire to get on in the immediate present,’ it is not unreasonable to suppose, is as potent in dentistry as in medicine, and unless sedulously guarded against, the sequence will correspond, the standard will fall lower and lower, and dental education become a farce.’ ”

It is my belief that the case is not quite so bad with the dental profession as the medical. The former is younger, its colleges are less numerous, and we have not yet quite lost the momentum acquired by the long-continued efforts to raise our standards of education and elevate our rank and file from the level of a trade to that of a profession. (There have always been many truly professional men among us, but very many had no just claim to that title, and the race of such is not yet quite extinct.) Although the dental profession cannot be held any more responsible for its condition than the medical, having no more “power over its own members” and no more “control over the gates through which men flock into it,” they are not yet ready to sit down in apathy or despair at the situation, but are disposed to make their *influence* felt in ways that shall come as near being a substitute for *power* as is practicable. We may take just pride, also, in the fact that the dental colleges have taken the lead in the movement to require three courses of lectures instead of two, in order to obtain a diploma. It is to be hoped that this will result in some substantial average increase of attainments before graduation; but there are some evils and dangers that will not be corrected in that way, and which may neutralize, in great part, the benefits of the lengthened term. The first of these is the almost entire indifference to the character and attainments of those who are matriculated, and this notwithstanding the nominal requirements of a preliminary examination or its equivalent. It is evident enough that many get in who cannot write English so as to be correct in either grammar or spelling, nor hardly so as to be understood. (If they are well educated in some other language that might not matter so much; I do not refer to

foreigners but natives.) There ought also to be a requirement of some knowledge of elementary chemistry. It is of little use to put a boy who has never looked inside a chemistry through such a course as is suitable for dental students. If the lengthening of the course has the effect to make the green boys think it necessary to leave the common school, the farm or the shop a year sooner than now in order to get through at the same age, the lengthening of the course to three years will not yield more than half the advantage it ought.

It is becoming evident that if we are to depend upon the operation of dental laws to elevate and maintain the standard of professional excellence, the scope of their operation must be enlarged so as to secure effective supervision of the qualifications of those who matriculate in the colleges, and also of those who are graduated from them. It seems reasonable to suppose that the authority of the State could be made effective with greater certainty and usefulness upon the teaching of students and the qualifications of those who enter the profession through the colleges, than upon the few who, having no diplomas, wish to remove from one State to another, or to enter upon practice by an examination before the State boards. Both the last-named classes are few in number, in comparison to the graduates, and incapable of lowering the general standard to any great degree.

After all, the training and qualifications of students up to the time of graduation will not make the profession what it should be, unless they are studious, public-spirited and ambitious afterward, and the chief value of a higher standard of entrance, of a better course of instruction, and more rigid examinations for diplomas, will be in the greater probability that men after graduation will have some adequate idea of the necessity for lifelong study and effort for personal ability and excellence and the honor of their profession. If a man's only desire after graduation is to make the most money and have the best time he possibly can in the immediate present, there is little hope that he will make much progress professionally. It may be very necessary at that time to give some time to society, and to see his best girl pretty often, but he will make a great mistake if he does not resolutely, persistently and with regularity reserve some time for systematic reading, study, and writing or teaching, or in some way assisting to promote professional excellence, good-fellowship and advancement. And this

is not sufficient, either, for it is important that a professional man should take a wider range than the subjects relating to his calling, and should be a studious and well-informed gentleman upon the affairs of his time, and the history, science, literature and poetry with which educated men are expected to be more or less familiar, but which few boys can acquire sufficiently before their entrance upon active life.

Finally, any thirty or forty graduates of a dental college, united together in a society, ought to be able and willing to do the necessary amount of work to make every one of its monthly papers a carefully prepared exposition of the subject undertaken, and the discussion of it both intelligent and interesting, and every one of its members ought to feel too much pride in it ever to be heard saying that the society lacks interest, unless he has himself done at least twice or three times his proportionate share to make it interesting.

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#### PUTREFACTION.\*

By E. A. ROYCE, D. D. S., Chicago, Ill.

Experience teaches us that when we have a disagreeable subject before us, the further we investigate that subject the less distasteful it becomes. Our subject this evening suggests the offensive, but I feel sure that it will prove less disagreeable as we learn more about it.

Webster says: "The act or process of putrefying is the offensive decay of albuminoid compounds, accompanied by the presence of, and probably produced by, minute organisms." In other words, putrefaction is the change of albuminoid substances of complex, unstable chemical compounds to more simple and stable compounds.

In the economy of this world life builds up tissues, and putrefaction breaks down that which has been built up by life.

Of the constructive life we will say but little, but we will try to find out what the process is that breaks down these chemical compounds of life.

The chemical changes in the process of putrefactions are very complex, and they do not seem to have been very thoroughly worked out, even by the chemists.

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\* Read before the Chicago Dental Society, January 7, 1890.



In case of animal tissues composed of fats and albuminoids, the albuminoids give way first, forming leucine, tyrosine—fatty acids and other primary products, ammonia, compound ammonias, sulphuretted hydrogen, hydrogen and nitrogen, as secondary products.

More slowly, but as surely, the fats give way, forming fatty acids and glycerine. The latter is further decomposed, but the fatty acids are quite stable in their composition.

Two theories have been battling for supremacy for years. The one, that the affinity of the chemical constituents of albuminoid substances for each other is so slight in the presence of water that even the least oxidation may disturb their equilibrium, and in that way reduce the whole mass to compounds of less complexity and greater stability.

The chemical force is transmitted from one atom of matter to another, as force is transmitted from one billiard ball to another.

This is all very well as a theory, but facts would call upon us to look well before we accept it.

The key note of the second theory of putrefaction is—keep life from death and you have no decomposition.

For instance, the choicest cuts of fresh meat served upon the table in this enlightened age, are cured by keeping at a low temperature a month or so, and heating to a boiling point and sealing from the air during ebullition, preserves the Chicago meat so it is used the world over. That all putrefaction is carried on with life has been demonstrated before us many times by Dr. Black in his very instructive lectures and experiments.

But is the life the cause of the putrefaction or is it only a product of this process?

We find that as far back as the year 1668, Francesco Redi, physician to the Grand Dukes Ferdinand II and Cosmo III, of Tuscany, proved that flies were the origin of the maggots of putrefying flesh, by placing fresh meat in a jar, covering it with a gauze so fine that the eggs of the flies when laid upon it, could not fall through, which caused the maggots to be hatched upon the gauze, and none appeared in the meat.

About 1838, Schwann and Latour discovered that the granules in yeast were vegetable cells, and that "they increased in a biological sense."

Soon after this it was proved that putrefaction could not take

place without the presence of life, and by destroying the bacteria and germs, and keeping the substance free from contamination by germs, no putrefaction would occur.

Dr. Black gives us the conclusions arrived at by Schroeder, after experiments in 1854.

1st. All vegetable or animal forms derive their origin from other living vegetable or animal beings.

2d. When a series of specific products of fermentation and putrefaction are developed at a certain spot, germs which originate the process have been conveyed to that spot through the medium of the air. Such is certainly always the case with regard to germs of mould, and to the ferments of wine, milk and urine.

3d. Vegetable and animal matter in which all germs have been destroyed by boiling, and which, while yet in a hot state, has been shut off from the direct influence of the external air by means of cotton-wool, remains perfectly free from mould, fermentation or putrefaction. The germs which otherwise would be supplied by the air are arrested in the passage of the latter through the cotton-wool.

4th. The germs of most vegetable and animal substances are destroyed by exposure for a short time to a temperature of  $100^{\circ}$  C. ( $212^{\circ}$  F.)

5th. But milk, yelk and meat, contain germs which are not thus killed. Boiling at a high temperature, under high pressure, or long-continued boiling at  $100^{\circ}$  C. will, however, always suffice to destroy these germs.

6th. The germs in milk, yelk of eggs and meat, after having been boiled a short time are still capable of being developed into the specific ferment of putrefaction, and sometimes, also, those of yelk; at least into long and indolent vibriones.

7th. The specific ferment of putrefaction is of an animal nature. It develops itself and multiplies at the expense of albuminous compounds, but does not multiply under those conditions alone which supply all the requisites for vegetable growth.

Pasteur, with his vast experience as an experimenter, has done as much perhaps as any one man to make the foundation of the vital theory secure.

He found that the principal agents of decomposition were what he called *Vibrios*; a species of bacteria that work in the putrefying substance as far from oxygen as possible, assisted perhaps by other species on the surface.

The usual manner of conducting experiments is to take two test tubes, one containing putrescent and the other sterilized broth, and a drop of the putrescent broth is carried to the sterilized on a sterilized wire, and every time in the infected tube we find putrescence and the development of bacteria similar to those in the tube from which the drop of septic matter was taken.

In this case the bacteria may produce putrefaction, but who can say that the putrescence is not the cause of the bacteria, or that the putrid liquid is not the active principal introduced.

Prof. Tyndall, in his experiments to prove the origin of life in putrefaction, performed many experiments which tend to show that the vital theory is true. The skeptic can say that most of these are not conclusive, because of some change in the air surrounding the infusions, which might render it inert.

I wish to present two of his experiments, not only to show the result in these cases, but also to show with what care all his work was done, that we may appreciate the full value of his statement when he says that in all his experiments not one of the infusions (some 10,000 in all) became turbid without his being able to account for the infection by germs.

"Sixty small flasks with very long necks (so as to be easily sealed) were filled four-fifths full of clear turnip infusion. These flasks were then placed in an oil bath, and heated until the infusion boiled, the flasks being carefully sealed while the steam still issued from the necks.

"In transportation to the Alps, the infusions in six of the flasks gave way; but in each case the frail end had been broken, giving the air access with its load of germs. Four more were also broken, leaving fifty clear and sweet at the end of a month.

"Twenty-three flasks were then taken to a hay-loft, and the ends snipped off. Twenty-seven were carried to a glacier. With the wind coming from the glacier, and all antiseptic precautions observed, the ends of these were stripped off.

"In each of the fifty, as the end was broken there was an in-rush of air.

"The flasks were then all hung in the kitchen, and in three days twenty-one of the twenty-three containing air from the hay-loft were invaded by organisms, but in three weeks not one of the twenty-seven containing glacier air had given way."



In a similar manner Pasteur proved that the air in the caves under Paris was free from putrefactive germs.

The proof that infusions brought into contact with unilluminable airs will not putrefy, is as follows :

“Wooden chambers or cases are constructed, having glass fronts, side windows and back doors. Through the bottoms of the chambers test-tubes pass, air tight : their open ends, for about one-fifth the length of the tubes, being within the chambers. Provision is made for a free connection through sinuous channels between the inner and the outer air. Through such channels, though open, no dust will reach the chamber. The top of each chamber is perforated by a circular hole two inches in diameter, closed air-tight by a sheet of India rubber.

“This is pierced in the middle by a pin, and through the pin hole is pushed the shank of a long pipette, ending above in a small funnel.

“The shank also passes through a stuffing box of cotton-wool moistened with glycerine, so that, tightly clasped by the rubber and wool, the pipette is not likely, by its motions up and down, to carry any dust into the chamber. The chamber is carefully closed and permitted to remain quiet for two or three days. Examined at the beginning by a bean sent through its windows, the air is found laden with floating matter, which in three days has wholly disappeared. To prevent its ever rising again, the internal surface of the chamber was at the outset coated with glycerine.

“The fresh but putrescible liquid is introduced into the six tubes in succession by means of the pipette.

“Permitted to remain without further precaution, every one of the tubes would putrefy and fill itself with life. The liquid has been in contact with the dust-laden air outside by which it has been infected, and the infection must be destroyed.

“This is done by plunging the six tubes into a bath of heated oil and boiling the infusion. After the infusion has been sterilized the oil bath is withdrawn and the liquid, whose putrescibility has been in no way affected by the boiling, is abandoned to the air of the chamber.

“With such chambers I tested in 1875 and 1876, infusions of the most various kinds, embracing natural animal liquids, the flesh and viscera of domestic animals, game, fish and vegetables. More

than fifty chambers each with its series of infusions were tested, many of them repeatedly.

"There was no shade of uncertainty in any of the results. In every instance we had, within the chamber, perfect limpidity and sweetness, which in some cases lasted for more than a year; without the chamber, with the same infusion, putridity and its characteristic smells."

The communication between the air in the cases and the outer air was perfect through the sinuous tubes; the only difference between the two was, the one contained germs in the form of dust, and the other was deprived of its germs by gravitation, which did not in any way change the air.

The outer air always gave putrefaction, and the unilluminable, never.

These experiments were repeated so many times that the conclusion must be that the bacteria derived from the germs are the cause of the putrefaction.

You cannot see the bacteria do this work, nor can you see the assimilation of food by man, but who doubts it? You never saw the action of arsenic upon the system, but we all know the deadly effect of this drug when taken into the system.

But how can so small a globule as a microbe batter down the tissues which go to make up an elephant?

It would be impossible for a man, with only his hands to work with, to tear down Chicago's new and much boasted of Auditorium, but given a number of men, each, with a little dynamite, how soon the structure would be leveled.

So with these scavengers. They are numerically the largest army in the world, and each carries his dynamite in the form of a digestive fluid, which is thrown out to chemically change fluids and break down tissues, so they may be readily converted to the support of life by absorption.

The microbe can eat green apples without the fear of the belly-ache, for the digestion is performed by the digestive fluid already spoken of, being thrown out and acting outside the body. This fluid has been seen by Drs. Black, Miller and others.

Dr. Black's proof that this digestion does take place, is to allow micro-organisms to grow upon a smooth surface of boiled potatoes. After they have spread over the surface, cut a thin slice from the potato, upon testing it chemically, it is found part of the starch has been changed to sugar.

The life force in the microbe must be fed. This is done by the assimilation of the digested material.

The waste products in any life are poison to that life. So, after a time the bacteria that first thrive in any substance may become inert and die, but there are other species upon which the waste material of the first has no effect, that are always ready to take the place of their dead comrades.

The digestion, absorption and excretion performed by this myriad of life will sufficiently explain the chemical changes of putrefaction which are said to be very complex, "always involving the simultaneous ingoing of a multiplicity of chemical reactions."

It has been proved that the digestive fluid of plants will disintegrate marble, and we have reason to believe that the solvent power of the digestive fluid of this organism is equal to that of a plant, and the continued action of such a solvent must in time affect even a tooth. Does not this relieve the poor microbe of the burden of physical labor that some of our friends have tried to load him with since Dr. Miller has given us his theory of the decay of teeth?

Putrefaction is continually in the mouth, to a greater or less extent.

After a cavity is once formed, it is impossible in most cases to cleanse it with the means at the command of our patients. So we have the continued action of this solvent.

The power of this small globule is again shown in putrescent pulps.

No one will claim that he can, by force of his own, split a tooth; but we all know that the chemical action of putrefaction produce gases which must escape, and sometimes, if no other way is opened, the tooth will split. Indirectly it is our friend, the microbe.

Putrescent pulps must be very thoroughly and understandingly treated to give us the best results.

The antiseptic treatment of to-day (be it hot air, clear water, drugs, or what not,) is aimed directly at micro-organisms, and is based upon the researches which have proved that no putrefaction can occur without life.

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PUS.\*

BY P. J. KESTER, D. D. S., CHICAGO, ILL.

For the purposes of the present paper, inflammation will be considered as a restorative process, and has for its object the re-

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\* Read before the Chicago Dental Society, January 7, 1890.



pair of injury or the removal of foreign substances that may have disturbed the equilibrium of the economy.

And the classification of Dr. Senn will be used, who divides it into two classes :

I. Simple or Plastic.

II. Infective or Destructive.

When from any cause there has been an injury to the tissues, due to traumatism or disease, there is an excessive flow of blood to the part, hyperemia ; and it is also noticed that the blood is richer in cell elements, leucocytes, tissue and embryonal cells.

The object of this congregation of cells is two-fold : First, the leucocytes are supposed to be the body guards of the tissue elements, and their office is to remove any obstruction or overcome any poison or other foreign substances that may have found their way into the tissues. Second, the tissue cells to build up and repair any injury that may have been done.

The corpuscular elements of the blood pass through the capillaries, the walls of which consist of a single layer of endothelial cells and the cement substance, whether by their ameboid movement (Arnold) or filter through (Conheim), is still a mooted question, but that they are present at the point of injury is known and the work of repair is begun, and in many cases the part is speedily restored to its normal condition, and such is the termination of simple or plastic inflammation.

But it is observed that inflammations do not all terminate as described above, that the products of the inflammatory process does not undergo transformation into tissue of a higher type, but that the cells undergo a retrograde metamorphosis and that there are other cells present, which are described "as round or irregular shaped cells of the size and general appearance of the *white blood corpuscles*. In a perfectly fresh state, examined in a medium normal to them, their protoplasm is finely granular with here and there a well marked oil globule. On staining them with almost any reagent their nuclei are brought plainly to view. The nuclei present many peculiarities which serve to distinguish it from all other cells except the *white blood corpuscle*. (The italics are mine). —*Med. Ref. Hd. Bk.*

Several theories have been advanced to account for the origin of the pus cell. Rokitsansky maintained the free cell theory, that they were formed from the exudates or blastema, describing the forma-

tion of the nucleus, around which was collected the granules, the protoplasm of the cell.

Stricker claimed that the tissue cells, under the inflammatory irritant, return to their undifferentiated embryonic condition and then rapidly proliferate, forming similar cells.

Virchow's earlier theory was somewhat similar; he regarded the connective tissue cells as the mother tissue cells in all new formations, and said that in inflammation the connective tissue cells under the stimulus which was given by the inflammatory irritant proliferated, and as a result of this proliferation the pus cell appeared in the tissues.

The author of the article on inflammation in the Ref. Hand Book of Medical Science, does not adopt any of the theories considered, but says they are "active living cells, and like other cells, have the property of dividing and forming new cells. They have been seen to divide by some observers."

He says: "And it is probable that a considerable proportion of the cells found, the exudations have arisen this way. \* \* \* \* \* Speaking of the certain changes in their shape, etc., he says: "Most of them are accompanied by the disappearance of the cell nucleus, the change which Weigert has taught us to recognize as the first step in coagulation necrosis; and in works on surgery, bearing so recent a date as 1888, pus is described as laudable, sanious, ichorous, etc."

If the labors of the most recent investigations are reliable, there is no such thing as *laudable* pus. Suppuration marks an era of destruction. Its product, pus, is the remains of the thing destroyed.

If we follow the description of the characteristic physical properties of the pus cell, it can be distinguished from all other cells, except the white blood corpuscle and tissue cells, and the conclusion seems reasonable that the pus cell is nothing more or less than dead and dying leucocytes and tissue cells.

That they show evidence of life is because the life of the cell has not been entirely overcome, and it is still capable of ameboid movement. This prominent and peculiar feature of the leucocyte has been explained by the fact that each cell has a reticulum of protoplasmic strings which, by contraction, give to the cell its irregular shape and the power of motion. The description of the leucocytes will answer for a description of the tissue cell.

The changes which occur in leucocyte after the fatal invasion of micro-organism or other poison may be briefly described.

Remembering that the cell consists of a nucleus-protoplasm, which is traversed by the reticulum and the cell wall, the micro-organism is found in the protoplasm which becomes more granular, but still retains the reticulum (protoplasmic strings and the power of motion), this is next destroyed, the nucleus disappears, and the contents of the cells undergo degeneration, the wall is ruptured, and the destruction is complete.

The fact that it has been observed that most of them (pus cells) are accompanied by the disappearance of the nucleus and the appearance of oil globules would seem to bear out the theory that they are leucocytes and tissue cells undergoing a fatty degeneration, rather than that they are *active* living cells.

The causes which bring about the destruction of the cell elements may be named in one word—micro-organisms. As early as 1865, Klebs detected the presence of micro-organisms which he found between the pus cells, and believed they were the cause of suppuration.

In 1872 he published the results of his researches during the Franco-Prussian war on septic wound diseases, and showed that micro-organisms existed in the tissues and organs, the seat of suppurative inflammation, before pus had formed.

Koch, in 1849, showed by his experiments that certain traumatic infective diseases in animals were the direct results of the presence of a definite micro-organism, and also discovered that so long as the cocci remained only in tissues at the point of infection, they caused only local inflammatory conditions, but as soon as they entered the circulation fevers and other symptoms of general septic infection followed.

In 1881, Ogston published his experiments (Senn) wherein he had examined the pus of 69 abscesses and found in 17 of them chain coccus (streptococcus) and in 31 staphylococcus (groups), and in 16 of them both forms were present.

*Rosenbach* discovered the staphylococcus pyogenes aureus, micrococcus pyogenes temis and three bacilli soprogenes.

Zuckman enumerates the following microbes as essentially pus producing :

Staphylococcus pyogenes aureus, albus and citreus, streptococcus pyogenes, and in foul abscesses also the bacillis pyogenes fœtidus.



Many experiments have shown that in all abscesses examined one or more above micro-cocci were found, and that there was no pus formed that did not contain them, except in cases of artificially produced pus. Pure cultures were made of the microbe found, and they were introduced into the tissues of animals and man, and under certain conditions invariably produced abscess, and examination established the fact that the kind of microbe introduced was found, and no other.

One curious fact demonstrated by the experiments was that considerable amounts of pure culture of the pus producing microbe might be introduced into the system without producing suppuration, or at times only slight abscess.

Tehleisen concluded from his experiments that the virulence of the pus does not depend on the number of microbes it contains, but is proportionate to the intensity of the inflammation in the individual from which it was taken. It would seem, then, that the pus microbe which is almost omnipresent, may be, and very likely is, present in the tissues without manifesting its destructive power.

The conditions necessary to produce suppuration have been studied.

*Tricoma.* After making many experiments on mice, rabbits and guinea pigs, concludes that pus microbes have a specific destructive action on the connective tissue, and limits it to this tissue, and believes when an abscess is formed in internal organs, destructive processes must first have preceded to prepare the soil for the growth of the microbe.

Watson Cheyne believes "that no aseptic substances or chemical irritants ever cause suppuration. He affirms that the product of inflammation which accumulate at the point of implantation or infection in such cases is not true pus, but a putty-like substance which is more consistent than pus, from the absence of ptomaines, and that in true abscess we require the peptonizing ferment produced by the micro-organisms, or at any rate of a chemical substance which prevents coagulation of the exuded fluid."

"He describes a minute abscess as containing a coloring of microbes which, when fixed in the tissues, cause a limited coagulation necrosis of the tissues in immediate contact with the microbes by the action of the ptomaines."

The question as to whether the microbe or the ptomaines are the direct agents in the production of pus remains as yet unsettled,

but it seems to be well established that the presence of the micro-organism is necessary in either event, as the ptomaines is a product of the microbe.

From the experiments made with the various chemical irritants, ptomaines and cadaverin, by the introduction of them into the tissues, the inflammatory products were so changed that they have the appearance of true pus; and with the definition already given, it may be so considered, with this difference, that the amount is limited to exactly the destructive power of the substance introduced. The pus so formed was found devoid of microbes, and was unable, when introduced into the tissues of animals, to establish the suppurative process, but that they are potent factors in the preparation of the soil for the growth and reproduction of the pus microbe.

From the foregoing we may justly conclude, first, that the pus cell is the direct result of the destructive power of micro-organisms or its ptomaines.

II. That the suppurative process can not be established by the introduction of chemical irritants.

III. That these pathogenic microbes may be present in the body without danger until a suitable soil has been prepared for their propagation and development.

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## THE FUTURE OF DENTISTRY.

### III.

#### DENTISTRY OF THE PRESENT.

(Continued.)

MR. EDITOR—I have thought over and upon this subject a great deal. In addition to thinking I have kept my eyes open and looked around me. I have visited dental colleges where I was not known and mingled with the students and listened to lectures by unknown men. I have walked the length of many miles of streets in several cities and read the signs on windows and doors and upon the whole sides of buildings even, and looked at the curious exhibitions of golden teeth and automatic jaws with clock works, etc., and the *specimen* plates and fillings in natural and artificial teeth. I have a collection of cards and clippings from newspapers, with and without portraits, and pamphlets issued by dentists extolling the high skill and the great pretensions of the authors; all these, Mr. Editor, and other curious things, gathered from time to time, have kept me thinking about the question, *is* dentistry a specialty of

medicine? I am well acquainted with a goodly number of professional dentists, and I think I know a few who are on the border-land of respectability—men whose reputation for veracity is good and in spite of the trade aspect of many dental practices, I am convinced that there are many practitioners who, from lack of proper training at the outset, fail to appreciate the necessity for taking a higher stand in respect to making their practice conform to the truly professional ideal. I have found from my own experience, that it is hard to rise above my surroundings. I have failed in this respect, but none the less do I deplore the fact, that I, like many others, am nothing but a dental mechanical artist. Until dental students entering colleges, are subjected to close examination, with reference to their preliminary training and education, there will be little improvement in professional methods. As it is now, nearly every dentist, wherever located, is anxious to secure quick results from practice, consequently he is eager to practice the right to control some particular patented article which he can use exclusively in a certain territory, or one that may be advertised to the public as belonging to him by license or otherwise. This tendency on the part of a dentist to make use of a particular form of plate or crown or bridge, which is only obtainable by securing the right or a license, takes from him his professional title as doctor, and it makes him a mere tradesman.

I want you to understand, Mr. Editor, that I am not opposed to patenting inventions that are useful in any department of the arts, or in manufactures, or in science, but I am opposed to dentists, or doctors, purchasing a *right* to use a particular cork leg, arm, artificial eye, or splint, or dental plate, crown, or form of bridging teeth. I do not think dentists use or prescribe proprietary, patented or secret pharmaceutical preparations, in any larger quantity in proportion to their number than physicians, save in one particular. Secret anæsthetics seem to be purchased more frequently, and are much more largely used by dentists than by physicians. My own acquaintance with and knowledge of physicians, leads me to believe that as a body they take more pride, universally, in upholding the dignity of their profession before the public at large than is the custom of dentists. From observation I believe there are more dentists who appeal to the public for support by advertising their fees on cards, posters, handbills, fences, signboards, in the public press, and by other other means, five to one of the physicians.



The trade aspect of dental practice is so apparent that argument is unnecessary. Dentists are known to underbid each other in the fee for extracting teeth, for making plates, crowns, fillings, and even in cleaning teeth, the treatment of abscesses, correcting irregularities, and in fact in nearly every department of practice. This is lamentable, but it is true. I personally know that there are dentists, respectable dentists, too, who tell their patients that they make no charge for "killing nerves" where they fill the teeth, nor do they charge for the treatment of abscesses, for the examination of teeth, for filling roots of teeth. Breaches of professional etiquette are so many and frequent that it seems useless to speak of such things; but, Mr. Editor, since you have kindly offered me the space, I will say that many persons—ladies and gentlemen—have told me that they have been asked to sit in the operating chair by dentists and permit an examination of their teeth, when they had only casually been in the dentist's office as a visitor, accompanying the person being operated upon! What would be thought of a physician or surgeon who would dare to hint that he would examine the throat, ear, eye, or any other organ of the body under such circumstances unless requested to do so professionally?

It is within my knowledge that dentists have expressed an opinion on the financial value of fillings in teeth when made by another dentist. This is not all, Mr. Editor. I have seen people who had been "shopping" at dental offices to get the fees for certain plates, fillings, etc., and on going away would say that, if they could not get the "job" done cheaper, they would come back and *permit* the dentist to fill or make the teeth. And dentists *permit* this to be done from day to day, respectable dentists, too. No, Mr. Editor, the more you inquire into the professional methods of the average dentists, the more you turn away sickened at the thought that these are your *professional* neighbors, ignorant, many times, that professional pride and professional instincts are not matters of professional education, but that they are implanted as cardinal principles, as the mind unfolds under the stimulus of a liberal education. Lectures on ethics are lectures lost to the uneducated, ignorant, professional boor, and who is to blame? Wherein will we find the method of cure for this evil? Where is the philanthropist or the corporation that will undertake the thorough training of the future professional dentist, who savors not of the workshop, and whose methods will not brand him as a tradesman?

VESUVIAN.

(TO BE CONTINUED.)

## PROCEEDINGS OF SOCIETIES.

## INTERNATIONAL DENTAL CONGRESS.

Summary Report of the Work of Section One. Reported by M. G. Blocman, M. F. P., Secretary.

(Translated from *L'Odontologie* for the DENTAL REVIEW.)

[Continued from page 789, Vol. III.]

A paper entitled "Herpes Zoster of the Mouth and Gums," was read by M. Hugenschmidt, of Paris, France, an abstract of which was published on page 725, of November, 1888, number of the DENTAL REVIEW.

## MICROZYMES AND CADAVERIC ALKALOIDS.

BY M. POINSOT.

According to Béchamp, the microzymes are being organized for the preservation of tissues, and it is only according to their disappearance and the appearance of microbes that tissues are in danger. The cadaveric alkaloids are the results of decomposition. They are not bad, excepting so far as they are favorable to the production of the many microbes one finds in the mouth. Once let the microbes be established, and it is necessary to extract the invaded tooth. Dead teeth are especially formidable.

After the reading of these two communications M. Poinot insists upon the first as making the assembly acquainted with two facts shown among his patients, one relative to an excess of nutrition shown in the case of a child of nine years whose gums and teeth were diseased, the other to an overworked child whose teeth became so affected that he was obliged to take to his bed.

## DISCUSSION.

Dr. Redard, of Geneva: I do not completely share the opinion of M. Poinot as to dental caries. The first and second dentitions are not sufficiently separated. During the first dentition one rarely meets caries of erosion, and one can never precisely determine the cause of it. As to the second dentition, I dispute the truth of syphilitic erosion. In order that there should be erosion, it is necessary that there should have been an acute illness during the period of the development of the child, or an arrested development very early in its life.

M. Poinot is glad to see Dr. Redard, of Geneva, share his opinion of the origin of erosions.

M. Dubois : It would seem, according to what has been said, that an erosion is an acquired disease, whereas it is well proved that it is always of congenital origin. For Hutchinson it was always of syphilitic origin ; for Parrot, also. He had even concluded, from the establishment of erosion in prehistoric skulls, that syphilis must have existed then. The beautiful works of Fournier show that the etiology of this malformation has numerous sources, and that any grave trouble during the period of formation of the crown may produce it. There is, then, at least a chronological error in the opinion of Mr. Redard, who attributes to the troubles of the second or third year the appearance of erosion.

Dr. Gaillard : Every time you have sickness in the parents, you will have erosions in the children.

## SUMMARY REPORT OF THE WORK OF SECTION TWO.

Reported by M. P. DUBOIS, Secretary.

### OPERATIVE DENTISTRY, SPECIAL THERAPEUTICS AND MATERIA MEDICA.

COMMISSION: M. M. Dubois, Dubrac, Poinso, Pourchet.

The Commission of the organization of the International Dental Congress had put, in the order of the day, the following questions :

First. *The treatment of teeth with diseased pulps, and with dead pulps.*

Second. *The comparative value of gold and of plastic substances for the filling of teeth, with an exposition of recent progress in the matter.*

Third. *Local anæsthetics.*

Sessions of Tuesday and Wednesday, the 3d and 4th of September.

Presidency of M. M. Gaillard, Saussine Poinso.

M. Pourchet, General Secretary, read, in the name of M. Amodeo, of Havana, a communication entitled

### TREATMENT OF DEAD TEETH WITH IMMEDIATE FILLING OF THE ROOTS.

He divides the affections of which he writes thus:

First. Treatment of teeth in which the pulp is partly alive and partly dead.

Second. Treatment of teeth in which the pulp has been dead for some time.

Third. Treatment of dead teeth with alveolar fistulæ.



He concludes that for all these divisions immediate filling may, perhaps, be practiced with advantage, and he says ;

“Since I have abandoned the old method of phenic acid and other irritants, I save a much larger number of teeth than heretofore. In about two years I have treated nearly 400 teeth by the immediate method, losing one only, and that by a wound caused by the uplifting of the amalgam filling. One other case among those which were treated for alveolar fistula refused to yield to the treatment I have described, and I was obliged to extract the tooth, remove the abscess and reimplant the same tooth.

“I advise my confrères to employ this method. The treatment of dead teeth can then be reduced to the treatment of the center of infection, and in consequence this can be disinfected at one sitting, as well as at several, whatever sort of tooth it is which requires treatment.”

Mr. G. Cunningham, of Cambridge, defends the same mode of treatment in a paper entitled

STATISTICAL RESEARCHES UPON RESULTS OF IMMEDIATE TREATMENT OF  
TEETH WITHOUT PULP AND WITH ABSCESS.

“The immediate treatment can be briefly defined; the method by which the roots of teeth without pulp or with abscess are treated and filled at one sitting, without having regard to previous conditions.”

He makes a résumé thus of the advantages of the method :

*First.* With the immediate method there are fewer extractions and less failures.

*Second.* There are fewer subsequent attacks accompanied by swellings and abscess, and consequently the immediate method occasions less pain.

*Third.* It requires much less time on the part of the patient and practitioner, the average duration of the treatment and filling of these teeth being less than an hour.

*Fourth.* In consequence of these advantages, we have succeeded in treating and saving many desperate cases, many cases represented in illustrations showing large perforations of the root, as well as others which had already been condemned by other practitioners as incurable.

*Fifth.* This method, rather than the substances employed, play a great part in the results, and it probably would succeed in a great number of cases without any medication whatever.

*Sixth.* By reason of the difficulty of diagnosing such cases, it is better to conduct the operation with all the antiseptic precautions.

M. P. Dubois made a communication on the same question. He differed in opinion from the preceding speakers. He concluded in the following manner :

#### TREATMENT OF TEETH WITH DISEASED PULPS AND OF THOSE WITH DEAD PULPS.

*First.* The preservation or capping of the pulp has happy, palliative effects when the pulp is only a little changed and has been recently exposed. If the exposure is very recent, as for instance, occurring accidentally during an operation, the capping may lead to the indefinite preservation of the organ.

In chronic inflammation of the pulp, the capping does not prevent decay of the pulp, but it renders it slow as it is in the teeth of the aged or in teeth afflicted with exterior swellings.

*Second.* The destructive treatment then is used in the great majority of caries of the third degree.

Arsenical compositions are the best agents for the destruction of the pulp. They act as irritants and not as escharotics. The medicaments which soothe the pain following arsenical applications, are those which cause a contraction of the small arteries : atropine, éserine and cocaine. The first is too dangerous to allow of being commonly employed, the second and third can be made use of ; the addition of creosote and also that of morphine are without useful action.

The compositions that diminish the pain diminish also the extent of the destruction.

*Third.* The radical treatment necessitates the complete extirpation of the débris of the pulp. The pain of the operation is lessened by repeated applications of sulphuric acid with cocaine.

The extirpation should be followed by the perfect filling of the canals ; the nerve broach, coated with gutta-percha in black oxyde of copper, is the most rapid and perfect means of accomplishing this.

Inflammation of the periosteum should not be produced either during or after a well treated case of caries of the third degree.

*Fourth.* The antiseptic treatment of the cavity and the manner of protecting it, are conditions of success in treating teeth affected with inflammation of the pulp. A dressing really closing up the

cavity, alone can assure success, and cotton charged with resinous tinctures but poorly protects a cavity from external infection.

*Fifth.* Excepting for the killing and extirpation of the pulp, caustics and strong acids should be avoided.

*Sixth.* The treatment of teeth with dead pulps, with or without neighboring disorders, requires the use of disinfectants and antiseptics. Rendering the cavity and canals healthy by mechanical and chemical means, nearly always triumphs over the most serious and inveterate disorders; but the most important step is the absolute protection of the cavities by the dressing.

The medicaments which answer best the uses of a fixed dressing are absorbents and volatile antiseptics (such as the hydrargyric solutions for teeth, where discoloration is not to be feared). They should not be caustics.

*Seventh.* To fill the tooth early is almost always advantageous. It is superior to immediate as well as to long-deferred filling.

*Eighth.* The reimplanted tooth seldom shows any noticeable indications. Treatment, after the tooth is in place, can almost always triumph over disorders, either dental or alveolar.

A tooth which cannot be successfully treated through the canal is seldom good enough to be reimplanted.

*Ninth.* Perfect filling of the canals is as necessary as in caries of the third degree.

*Tenth.* Internal medication, repellant applications to the gums, as in the creation of an artificial outlet, cannot be employed except as accessory and auxiliary to the local treatment of the tooth itself.

Dr. Parr, of New York, explained the advantages of a *small instrument for use in disinfecting canals*.

This instrument has a ball of brass at one end and tapers to a silver point. In heating the ball the warmth radiates to the point, so drying the root canals.

#### DISCUSSION.

M. Dubois. It is necessary to distinguish between the caries of the fourth degree, for numbers among them are only caused by a limited affection of the canals, and we know that in these cases the restoration to health of these canals suffices to re-establish the health of the organ and to permit of lasting and immediate filling. Sometimes, also, the trouble is deeper, and to obtain a lasting cure it is necessary to render healthy not only the canals but the socket.



I am in favor of immediate or early filling, on condition that it may be provisory, permitting of subsequent watchfulness and care.

The figures of Mr. G. Cunningham show four instances of inflammation in forty-five cases. I consider that these might have been avoided by a less percipitate treatment. It is evident that if one compares immediate filling with treatments made with the aid of repeated soft dressings, the advantage is on the side of the latter. But a pretty long experience convinces me that a provisory filling, that is to say, an air-tight dressing, insures even superior results.

M. Chauvin, of Paris, asked Mr. G. Cunningham if he had seen his patients again long afterward, and added :

"For my part, I consider that in caries of the fourth degree the dentine tissue is most often infected by its intimate connection. It is not only disinfection by overheated air and absorbed antiseptics that will answer for deep decay, and it seems to me impossible that the treatment should be finished at one sitting."

Mr. G. Cunningham : I will answer M. Chauvin. Some of my patients I see again, although I have to do with a university-population, which is necessarily floating. I will also answer M. Dubois, that we are not strongly opposed, but that in any case he does not bring, as I do, statistics to support his affirmations.

Dr. Dunogier, of Bergerac, read a paper on INTERNAL TREATMENT OF ODONTOLOGY. He said :

"Certain medicines exercise upon the *trijumeau* a powerful action. So much so that their effect in numbers of cases may be called mathematically precise, leading to the diminution or cessation in the space of a few hours in a day, of pain which might continue many days, and necessitate either the extraction of a useful tooth or a very painful operation, such as the removal of the pulp, which has the unfortunate effect of transforming caries of the second degree to caries of the third degree.

"As for us, we no longer neglect as soon as local treatment seems to us insufficient, after having thoroughly tried it, to have recourse to remedies."

We close by presenting the following formula, which for several years has given us the most constant and rapid results :

R Crystallized aconite,  $\frac{1}{4}$  milligramme.

Gelseminum, I "

Valerianate of quinine, 5 centigrammes for a pill. Two or three pills every 24 hours (for an adult).

## DISCUSSION.

M. Dubois: As dentists we ought to give local treatment, and it is only occasionally that internal remedies should be put under contribution. They are never more than auxiliaries, and do not remove the necessity for direct treatment of the injured parts. I regret, since the author of the communication spoke of very dangerous medicines like aconite, that he should not have made mention of a medicine relatively anodyne and more efficacious in inflammation of the pulp and periosteum—antipyrine.

M. Redard, of Geneva, read a paper on *CARIES OF THE THIRD AND FOURTH DEGREES*.

He insists, above all, upon the necessity of employing an amalgam having little shrinkage, and describes a little apparatus of his invention permitting of the measurement of densities. He showed then the method of treatment that he praises; treatment which consists in never destroying the pulp, and never taking out the debris in the canals. According to him, the pulp should be cared for, and not destroyed or removed, and this can be accomplished by the use of antiseptic preparations. Thus arsenic and the nerve broach have no reason to be.

## DISCUSSION.

M. Poincot, of Paris: You employ several mixed antiseptics. Do you find that better than to use them separately?

M. Redard: Mixtures are favorable. Non-success is due to too strong doses.

M. Dubois: For M. Redard, arsenic and the nerve-broach have no more reason to exist. Our art is thus much simplified. I am not of his opinion. That means capping, without all the precautions indicated by Witzel, and he can but have, in the long run, a large number of failures. I believe I shall not be contradicted by many of those here in saying that the system of M. Redard can have only palliative results.

M. Caracatzanis, of Athens: I have had occasion to see, at Athens, teeth treated by M. Redard five years previously, the teeth being in good condition.

M. Chauvin: That proves nothing. If the system of M. Redard was experimented with in several climates, one would quickly be convinced of its bad results.

M. Thuillier, of Rouen: I do not believe it possible to save a

pulp arrived at the stage of suppuration according to the advice of M. Redard.

M. Redard : I only affirm what I have succeeded in for seven years. The instances exist. The plan has been pursued in the dental school at Geneva, and in my clinic. The antiseptics triumph in these disorders.

M. Schwartz, of Nimes, mentioned a method of

TREATMENT OF THE ROOTS BY THE EMPLOYMENT OF A VACUUM.

He says that he obtains a vacuum more perfect than that of the pneumatic machine by an instrument of his own invention.

M. Poinso : In 1876 M. Colon constructed for me a pump to produce a vacuum, by the use of which I once drew out a pulp.

(TO BE CONTINUED.)

#### CHICAGO DENTAL SOCIETY.

Regular meeting December 3, 1889, Dr. P. J. Kester, President, in the Chair.

DR. D. B. FREEMAN read a paper on

THE EFFECT OF ERUPTIVE DISEASES ON THE TEETH.

DR. A. W. HARLAN, in opening the discussion, said : I do not feel like letting this important subject go by without discussion. It is one of the questions that perhaps is little known of by the mass of the dental profession. One of the difficulties of arriving at a proper method of discussing this subject is the confusion existing in the minds of dentists regarding the effects of syphilis on the permanent teeth—inherited syphilis—and the effects of eruptive diseases as we know them by the names of scarlet fever, measles, chicken-pox, and diseases of that nature.

Now, if you will consider for a moment that about the eighth week of intra-uterine existence the foetus has within the foetal jaw the germs of all the deciduous teeth, and that about the sixteenth week the germs—the enamel organs of the permanent or succedaneous teeth—are present in the foetal jaw. Calcification of the enamel organ of the deciduous tooth, or, indeed, of the whole dental arcade, at that time begins sufficiently early, and is carried on sufficiently well, so that if a child at two or two and a half months after birth acquires an eruptive disease like the measles, or scarlet



fever, or any peculiar eruptive disease of that kind, its temporary dentition is not affected. On the other hand, calcification of the enamel organ of the succedaneous teeth begins and progresses so slowly that at the time of birth they are in such an incomplete state of development and outline that an eruptive disease acquired any time after the first day of the child's visible external life up to a period ranging between three years and three months and four years and three months, the crowns of the teeth of enamel organs that are in process of development may be affected accordingly, as the eruptive disease is severe, protracted, or slight.

I have had occasion during the years of my practice to observe the teeth of a great many children, and I have been able to trace in a large number of cases almost the exact date of the acquiring of the eruptive disease by the markings of the enamel of certain teeth. If a child, for instance, acquires measles at two and a half years of age, the probabilities will be, and are, that the central and lateral incisors, probably the cusps of the first bicuspid and the first molar will be very seriously affected, and they will be dwarfed and have a very peculiar shape.

If, on the other hand, a child acquires an eruptive disease at six or nine months, in addition to the distortion of shape, there will be pits, and fissures, and honeycombing, particularly of the first permanent molar, and likewise to a greater degree of the crowns of the central incisors, and the cuspid will escape. If a child acquires an eruptive disease at about three and a half years, or three years and nine months, especially one that is not considered a precociously developed child, the probabilities are that the second bicuspid and the cuspid tooth will be the only ones that are affected. There are no crescentings of the incising edges of the central incisors, as a result of the eruptive disease acquired at an age ranging from two and a half to four and a half years. If an eruptive disease is acquired earlier than that, there may be almost a blunt end of the two central incisors and a considerable dwarfing of the shape of the laterals, and a very considerable lack of enamel on the crowns of the molars with little pits of enamel, so to speak, fused, more or less transparent, but not very firmly attached to the dentine beneath.

When we consider the structures from which the enamel organs are derived, we learn at once that some of the most eminent histologists deny that above the basement membrane in the division

of the mucous membrane, as divided by Legros and Magitot, there are no terminal nerve filaments in any of that portion of the mucous membrane or of the skin. This has been denied by Dursy and several other authorities whose names I do not at present remember. When an eruptive disease is acquired, it will be found that it most seriously affects that portion of the skin above what we term the basement membrane, that is looking at the skin externally we have the corneous layer and immediately beneath the Malpighian layer and beneath this the so-called structureless membrane, described, pointed out, and placed permanently into our histological literature by Todd and Bowman—I say that portion of the skin affected, of the mucous membrane, the alimentary canal and the intestinal canal, is above that membrane, and consequently when we do have an eruptive disease that affects, or may affect the teeth during their development, it is only the enamel organs of the teeth, and similarly, Mr. President, it is the analogous structure of the hair that is likewise affected under similar circumstances.

I have been in the habit of teaching, when it has been my duty to teach anything in this connection, that doctors, dentists and parents in general should try by all possible means to prevent their children or the children of their patients, from acquiring any “innocent” eruptive disease prior to the attainment of the fourth year or thereabouts, or perhaps a little longer, because if you will contemplate for a moment the number of malformed, disfigured teeth, of the number of people that have applied to you at various times to have their central incisors and lateral incisors either restored by filling, or to have the crowns cut off because of their being dwarfed and malformed, you will see that it becomes the duty of every dentist who takes the slightest interest in this subject, to warn the parents of children against it and to disseminate as far as possible, the knowledge that he may have upon this subject, so that he will be able to diminish the cause of visible deformity of the teeth.

DR. W. W. ALLPORT: There is only one point that I will discuss, and that is Dr. Freeman does not believe that eruptive diseases have much effect upon the tooth structure. I supposed that it was generally acknowledged that eruptive diseases do have effects upon the teeth during their early formation or development. I did not intend to say anything whatever upon this question, but I think we are under obligations to Dr. Harlan for the very clear

manner in which he has discussed the basal principles, if I may so use the term, underlying this subject.

There is one point more I wish to refer to, which would seem to controvert the views advanced by Dr. Freeman. If he will recall to mind one fact he will see that he is mistaken.

If any of you go over a set of deformed teeth, and look at the markings on them—the permanent molars, bicuspid and incisors, as Dr. Harlan has suggested—you will find they correspond with all those teeth in a straight line with the period of the progress of calcification in them by the period of the eruptive disease. In this way there will be markings of the teeth left to correspond exactly in their development with the period of the disease. I say this for the express purpose of showing that eruptive diseases must have some effect upon the teeth, and that Dr. Freeman's opinion is based on error.

DR. J. G. REID: I believe, as Dr. Harlan does, that eruptive diseases certainly have something to do with the defects which appear on the permanent teeth. There are very few dentists, probably, who have what is known as Dr. Black's chart, showing the contemporaneous calcification of the teeth. If they had one in their office to refer to when a child presents itself with such defects, it is an easy matter to trace at once, by referring to that chart, calcification of the permanent teeth. If you have one of these charts in your office as a reference, it would prove a valuable addition to your library.

DR. J. A. DUNN: I keep one of these charts in my office, where I can look at it at a glance. I have found it very valuable, and believe in the effect of eruptive diseases on the permanent teeth and the enamel just forming. When a child comes into my office with a tooth marked, I invariably look at my chart. I am more thoroughly convinced than ever that the teeth are affected.

If the teeth are affected, what can we do to prevent it? Perhaps the only thing we can do is to inform ourselves in regard to it, thoroughly understand it, and then instruct our patients and the parents of patients in regard to the matter. I have been able to verify my observations in nearly every case by questioning the parents of patients.

DR. J. G. REID: Dr. Harlan has suggested that we teach parents to protect their children from acquiring eruptive diseases. I do not think this can be done. There are a great many eruptive



diseases, such as scarlet fever, chicken pox, etc., that are very mysterious in their acquirement. Sometimes it is impossible to determine the source of the contagion.

DR. P. G. LAWRENCE: Dr. Harlan spoke of instructing parents to prevent the eruptive diseases being acquired by children, and Dr. Reid saying we cannot prevent them, led me to think that we *can* prevent them. I believe if parents are instructed, as Dr. Harlan has said, to use their utmost efforts in preventing children from acquiring the eruptive diseases after a certain age, considerable might be accomplished. There is no question but what there are cases of small-pox, measles, chicken pox and scarlet fever which come on mysteriously.

We may attempt to protect children from exposure, but what are we going to do with those patients that come to us to have the crowns of their teeth restored?

In the case of a boy about 8 or 9 years old, the crowns of two first permanent molars showed that calcification had taken place apparently not more than one-eighth or one-sixteenth of an inch above the gum. They were badly decaying and troubling him so much that I extracted them. The permanent central incisors were similarly affected. The question to me was, what could I do to save them? An effort might have been made to fill them with gold, but the edges were very sharp, just like the teeth of a saw, and cutting or excavating them would shatter the whole body of the crown, and the question is, what are we to do in such cases?

DR. A. E. BALDWIN: I do not want to say anything that will throw discredit upon well-established facts or theories, but I think if any of us who have had any special observation in the medical world, as well as in dentistry, or outside of either, we will recognize the fact that there are few children that attain the age of four years but what have had one or more of the eruptive diseases prior to that time. I venture the assertion that there is not one out of five in this hall to-night but what has had, before he attained the age of five years, one or more of the eruptive diseases, and there are very few of us who have had these diseases where they have left manifest markings upon the permanent teeth. I believe this statement can be verified by observing people. I do not wish to state that the eruptive diseases have *no* effect, as a rule, upon the teeth, but I *do* believe that they have no effect on the permanent teeth.

You may take two cases of scarlet fever, if you please; one a very mild case, and the other a malignant one, the latter interfering largely with nutrition during and subsequent to the disease, and you would naturally expect a very much more marked effect upon the teeth and other tissues of the body in the second case than in the first. I frankly believe that it is largely the exception rather than the rule that they leave their effects upon the teeth.

With regard to the charts that have been referred to, I think all will bear witness that the markings on the teeth are the same either from an eruptive or other disease that has produced a marked impression upon the nutrient portion of the system. I believe they are just as likely to result from a non-eruptive as from an eruptive disease.

In two cases children had had no eruptive disease whatever until after they were eight years of age, and yet they showed a marked deficiency in structure, which would be indicated on the charts at about three years in one case. I do not remember the other, but should say near three years according to the chart. I questioned the parents minutely and found in each of these two instances the children had had whooping cough of a severe type for a long time. That was the only affection that could be found out from the mothers that the children had had, and yet the markings were very distinct. It is the lack of nutrition rather than an eruptive disease. How often do we find eruptive diseases leaving no effect either upon the skin or the underlying tissues? If they do not have any permanent effect upon these tissues, we may rest assured they will have no permanent effect upon the structure made from a modification of these tissues. In three or four cases which have come under my observation, I have noticed that children, at the age of two to four years, during the formative periods had severe attacks of eruptive diseases, and so far as I could see, with no appreciable effect upon the teeth whatever. Now, I explain that matter in this way: While the disease was in its local manifestations very severe, (yet in its systemic effects it was not so) in interfering with the nutrient organs of the body. Of a hundred children brought to you that have had scarlet fever, for example, which is certainly one of the most severe diseases, and you will find that not more than five to fifteen per cent of that number will manifest on the teeth the markings of the disease.

DR. REID: I would like to ask Dr. Harlan a question: Is

there a possibility of any one of the eruptive diseases leaving its effects more than the other? Is scarlet fever worse than chicken-pox, or chicken-pox worse than measles?

DR. LOUIS OTTOFY: A few years ago I gave this subject more or less attention, and I came to the conclusion at the time, and I have not had occasion to change my mind since, that we have entirely overrated the importance of the effect of the eruptive diseases upon the teeth. In the number of children that have come to my office it was almost impossible to find out from the parents the exact age when the children had an eruptive disease. If you look upon the chart, and from it judge that the child must have had an eruptive disease at such a time, and you state it to the parents, nine times out of ten they will say it is a fact. If both parents are present there will be a question whether the child had the disease or not at four or five years, consequently the opinion of the parents is actually and positively worthless.

Then, again, as stated by one of the previous speakers, there are cases where it is positively proven that children have had no eruptive diseases whatever, and in many instances have not been ill to any extent, and yet we find these marks to some extent upon the teeth.

I don't think we ought to attach so much importance to eruptive diseases having been the cause of certain marks on the teeth.

DR. D. B. FREEMAN: I would like to ask Dr. Harlan whether he has ever seen the same marks on the second molars?

DR. HARLAN: Mr. President—I do not rise at this time for the purpose of making very extended remarks. I am not unaware that some very high authorities have written pamphlets, brochures, and even works denying that eruptive diseases affect injuriously the growing enamel organs of permanent teeth. I listened myself in the section on diseases of children, in the International Medical Congress, in London, to a very lengthy essay written by Dr. Magitot, of Paris, and afterward read it. This essay was written to prove that the convulsions of infancy were the cause of the ridges, pits, depressions and honeycombs of teeth.

That was controverted by another distinguished French gentleman (Parrot). It was commented on by no less an authority than Charles West, whose work on diseases of children is classic. There were even other and no less celebrated gentlemen who participated in that discussion.



I have read the classic work of Henoch on diseases of children and the results of his (more than forty years) experience and observation in both hospital and private practice. I am not unacquainted, Mr. President, with the works of Starr and other reputable and scientific authors in America on diseases of children, and I am prepared to say that the light I have on this subject, with the observations I have made myself in the study of the jaws of children in museums in Baltimore and London, and in the museum of comparative anatomy and histology in Paris, that while it is true that all children who acquire eruptive diseases between the ages of one month and four years do not have ridged, pitted, warty, and honeycombed teeth, yet I do say that children generally do not acquire eruptive diseases when they are in the midst of robust health, that many times it is the enfeebled children, the poorly nourished children, children that are more or less inanimate at the time of acquiring the disease, and that in spite of the effects of the eruptive diseases upon the heart and the kidneys, the hearing and frequently on the eyes, that they survive, and when their teeth arrive at maturity, they are malformed under those circumstances. I would like to inquire whether any gentleman present has a more ingenious or plausible theory to advance for the cause of pitted, ridged, honeycombed and warty teeth? I would like to inquire further if there is any gentleman present who, with his knowledge of the literature of the subject, can say that some of the inherited diseases, as syphilis, and that general conglomeration of an undescribed, unprecedented in many points, disease known as scrofula is to be the father of all these defective teeth? I am perfectly well aware, and I agree with Dr. Baldwin, that it is an arrest of nutrition. I want to say that on account of the division of the mucous membrane from within outward or from without inward, the enamel organ is derived from, built up, and nourished by these divisions of the mucous membrane that have been named. Legros and Magitot make the best classification of the mucous membrane we have in the English or any other language, and it is adopted by the best writers and authorities. I say the portion of the skin or of the mucous membrane lining the mouth, the antrum of highmore, the œsophagus, the stomach, the intestinal canal, etc., is most injuriously affected. When the disease or local disturbance is slight the teeth may not suffer; perhaps some other organ or organs will suffer. I do not come before you and try to make you believe (nor

do I believe it myself) that every eruptive disease, if acquired between the ages named, would cause such derangement of the growth of the enamel organs. One person will acquire a disease, run through it, and after he has recovered no one can tell that he has had it. Do not the most eminent syphilographers say that occasionally a person may acquire syphilis and it will run its course and that the person will get well spontaneously and he will never know he has had syphilis? No less an authority than Keyes, of New York, who is as good a syphilographer as there is in this country, has stated that syphilis is a disease that "surprises" and invites the interested student to that subject. So I say there are eruptive diseases acquired, and a child may recover and there will not be a single lesion in any organ to show that it has had the disease. On the other hand, similar cases with dissimilar conditions at the time, will show a defective heart during the disease, and afterward the kidneys may be permanently affected, and we all know that in scarlet fever the heart is affected, the eyes likewise, and even other organs of the body.

With reference to the charts, of course they are diagramatic, and it is an effort in the right direction. I am acquainted with Dr. Peirce's and Dr. Black's charts. While they may not be accurate in some cases, yet it is an effort to place us on the right track, and therefore as guides to us they are valuable.

With reference to the advising of parents, it is not necessary for the most intelligent people, as a rule, but you must remember that the people we come in contact with in infirmaries, and even in private practice many times, are not people of education, learning, or refinement, and that very many times if we give them a proper hint they will not do the foolish things they have been in the habit of doing before.

I do not intend to take up much more of your time. All I want to do is to call your serious and earnest attention to this subject. It may be true that one or two of Dr. Freeman's children have passed through an eruptive disease, and their teeth are not affected or disfigured. I may have half a dozen children go through it and every one of them have their teeth affected. I try to prevent children from acquiring diseases of this nature, for in many instances the exact source is not known; consequently such children have no honeycombed or fissured teeth.

In answer to Dr. Freeman's question I would say that if we con-

sider for a moment that there are twenty deciduous teeth, and that four are to be added at the sixth year, which makes twenty-four, that leaves only eight, or twenty-five per cent of the total number of teeth yet remaining. Taking the third molar from these, there will be  $12\frac{1}{2}$  per cent. The period when the enamel organ of the second molar tooth appears in the jaw is about three years after birth. The period of calcification of the enamel organ runs along probably until the 9th, or between the 9th and 10th year; very seldom as late as the 10th, especially in large communities or cities, or manufacturing districts where coal miners live, or where people are huddled together in lumbering camps, stone quarries and places of that kind. The liability of a child acquiring an eruptive disease is so much greater between the period of birth and the attainment of four or five years than it is after that period and the tenth year, when the teeth almost entirely escape; but they do not *universally* escape. I am depending on my memory now. I have seen four sets of teeth where the second molars were affected in that way by little transparent nodules of enamel on the different cusps, and the dwarfing of the points. I have seen only four sets in all my experience, which is a small number. So I believe it is comparatively rare that the second molar is affected by eruptive diseases.

DR. BALDWIN: Dr. Harlan called on any gentleman to give a theory which was more plausible and accurate than the one now generally accepted. I must say I know of nothing more plausible. After considerable observation, study and experience in the general practice of medicine, and diseases of children, I cannot advance any theory more plausible than that which he has advanced. I know there are a great many excellent authorities who support the views advanced by Dr. Harlan, and others, and yet these men may be mistaken.

DR. FREEMAN, in closing the discussion, said he had been pleased with the remarks of the different speakers, and that the discussion reminded him of a paper read before the Illinois State Dental Society some years ago, by Dr. Ingersoll, in which he advanced the theory that the cause of all the ridges and pits found on the teeth of children were due to alternate vital action.



# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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## VOLUME IV.

With the January number, the DENTAL REVIEW begins on its fourth volume. As we look over the files we scarcely realize that thirty-eight numbers of this journal have been printed and distributed in various portions of the world. Nearly two thousand five hundred pages of printed matter, of which none had previously appeared in English in any other journal. Our venture was begun with inexperience, but with the promise of help from many sources. The majority of the promises have been redeemed. Had we not received the invaluable aid of Professor G. V. Black, of Jacksonville, Ill., and the support of the profession of Chicago and of Illinois, we would have suspended publication at the end of the first year. Papers and reports of society meetings came to us from friendly hands all over the United States and from foreign shores; letters and news items poured in until we were convinced of the appreciation of our efforts by readers of intelligence and discrimination.

We were not faultless, by any means; mistakes were numerous, but experience has gradually minimized them, until now, at the beginning of a new year, we feel that they will be counted fewer in 1890 than in 1889. Our readers doubtless already know our position on three important points: I. Higher education and no increase in the number of dental colleges; II. The perpetuation of International Dental Congresses at intervals of three or five years; and III. The maintenance of the dignity and standing of the dental profession as a profession, and the advancement of dental science.

## THE SKULLS OF THE MOUND BUILDERS, ETC.

We have in our possession the manuscript of the most ambitious attempt at a critical examination of the skulls and teeth of various races and 150 mound-builders ever undertaken by a dentist in this country. We will publish the whole of it in one issue—perhaps in our February number. The author of the paper in question has been engaged on the work for more than two years, and it will well repay a critical reading, and at the same time will prove a valuable reference companion when discussing the subject.

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## REVIEWS AND ABSTRACTS.

THE AMERICAN DENTAL ASSOCIATION AND ITS TRANSACTIONS FOR 1889.—The “Transactions of the American Dental Association,” recording the work of that body at its twenty-ninth annual session, held at Saratoga Springs last August, has been distributed.

The volume is a credit to the veteran Secretary of the Association, as well as to the publishers whose imprint it bears.

Perusing the book, the fact becomes patent that the Association is abreast with the advancing lines of thought and action, the country through, but nowhere does its standard seem to be in advance of the lines already established by local and State societies.

While ostensibly the fountain head of the ethics of the profession of this country, an amusing incident occurred in this meeting, showing that many of the members had become somewhat callous and allowed ethics to drop into desuetude. The youthful Nestor from the Wild West, who exposed the mote in his brother's eyes, had the tables turned on himself most beautifully. It was not exactly a case of pot calling kettle black, but a confession all around. We all do it, and a mental agreement that: Oh, no, we will never do so any more.

The first 34 pages of the volume are devoted to the purely business transactions.

From this it is gleaned that the roll of the Association membership contains 179 names. Of this number there are 46 who were present as delegates only. This leaves the permanent membership of the organization as 133. Of this number there were present at some time during the session, 54.

An attendance of only 40 per cent of the permanent membership does not testify to extreme enthusiasm. An analysis of the forty-six delegates who represented constituencies, shows that of the forty-two States, only the State societies of Colorado, Delaware, Georgia, Indiana, Illinois, Michigan, New Jersey, New York, Ohio, Vermont and Virginia (11), were represented. There were also 10 local societies represented—four from Chicago, three from New York (State), and one each from Philadelphia, Washington and Boston. Of the colleges only 9 were represented by accredited delegates, namely: 2 from Maryland, 2 from Missouri, 2 from Pennsylvania, and 1 from Michigan, Iowa and Illinois each.

As the claim is generally made that this society is *the* representative body of the dental profession of the United States, and that therefore its dicta, professionally, scientifically and politically, should be received with submissive deference by the entire dental laity; this analysis clearly proves that the Association must bestir itself if it desires to sustain the claim for leadership.

Its founders, no doubt, intended that the Association should be the recognized mouthpiece of the dental thought and aspiration of this entire Country—in short, its representative body—in its broadest American sense. If it desires to have its *ipse dixit* respected by the entire profession, or even a large majority, it should encourage a larger delegate attendance.

Ever since the system of working in sections was adopted, the Association has gradually dropped to the same position regarding the dental profession, that the American Medical Association occupies toward the medical profession.

Under the system of working by sections, the delegate members are practically relegated to the position of lookers-on. They belong to no section, and are nowhere.

The sections are made up at the close of the annual sessions, and therefore the delegate for one year can have no voice in the organization or work of any section. In the medical profession, which is so much more comprehensive, and embraces so many special fields for practice and observation, there seems to be some reason for dividing up into special sections. With us division is not the creation of strength. Several societies, with as large a membership as that of the Association, have done nearly as good work as it, and without dividing up into seven or eight different bodies. These do not have nearly so large a constellation of stars



to send forth the effulgent rays of their bright lights, as has this Association. The only possible excuse for this sectional system seems to lie in the fact that it is the way the medical men do; and we, as "medical specialists," must follow.

It is noted that an hour was set apart by special resolution for the consideration of the subject of the "Dental Congress to be held in Paris in September." The minutes are searched in vain for a record of what was said on this subject, and the inference is fair that nothing was done either pro or con. However, at a later date in the proceedings, the same gentleman who offered the former resolution moved that the next annual meeting of the association be fixed for a time that should not conflict with the International Medical Congress which meets in Berlin; this was carried.

From this, if the decrees of this Association are to be looked upon as leaders in policy for the entire profession, it is reasonable to conclude that dentists care nothing for an international dental congress, but are thoroughly in accord with an international medical congress.

If there were those in the Association who held contrary views, they observed a singular and most inexplicable silence at a time when they should have spoken. It is a question that deserved calm, fair and considerate discussion. The profession generally will be slow to adopt as authoritative, final and correct, a verdict reached by a court whose jurisdiction is subject to question, and which was reached without a trial or debate.

The sum of \$1,000 was set apart for the use of Dr. Crouse, from the funds of the society, in the defense of a personal suit brought against him by reason of his daring and unselfish courage in behalf of the dental profession. For this the Association deserves the hearty thanks of every fair-minded citizen.

A resolution was also adopted that only such dental colleges as would establish a three years' course as a prerequisite to graduation could be represented in the Association.

The place for holding the next meeting of the Association is Excelsior Springs, Mo. It appears from the minutes that only one ballot was taken, and that Boston, Long Branch and Detroit were also candidates.

At the election for President, upon the first ballot one gentleman received a majority of all the votes cast, but it was decided that the ballot was merely an informal one, and upon a second bal-

lot, another gentleman received a majority of the votes cast and was declared elected. To one who was not present at this election, and who is not acquainted with the customs of elections, in this body, it seems singularly inconsistent that the first ballot which gave a majority to the place of meeting should not have also been declared informal, or, having recognized the choice of the first ballot, in that instance, the same rule should not have governed the other election.

The fact that no indecorous wrangle ensued in consequence, speaks volumes for the peacefulness and gentlemanly forbearance of the members.

The annual address was delivered by the President, while the genial and venerable Dr. Atkinson occupied the Chair.

Just why—the Vice-President being present in the hall—the meeting should have been presided over by an unofficial, though ever so distinguished and beloved member, is a conundrum in parliamentary usage that the writer gives up.

The substance of the President's address is contained in the following quotation as its text: "I do not propose any review of the progress that has been made in the profession during the year. \* \* \* Neither do I purpose to attempt to advise or suggest to this body what they should do, but I desire to speak of the early helps of professional life which I enjoyed and some of the true men I have known."

The point emphasized was the helpful hand the older and more experienced can give to their younger brethren—the illustration being drawn from the President's personal experience.

Section IV, Histology and Microscopy, presented a paper by Dr. Frank Abbott, its chairman, on the "*Growth of Enamel*."

It covers some 14 pages illustrated by five drawings. The discussion which follows was participated in by Drs. Sudduth and Atkinson. Both of these gentlemen, however, exercised the license of preachers, by simply using the text as a pretext to talk about something else. The discussion being as to whether histological drawings or photo-micrographs were the more correct.

Section V, Materia Medica and Therapeutics, had a very brief report from its chairman, Dr. A. W. Harlan.

In this the desirable qualities of the essential oils in dental practice are advocated by reason of their being local anæsthetics, stim-

ulents, non-coagulents, sparing solubility in water, diffusibility and volatility.

The discussion which followed, was largely devoted to the oils of cinnamon and cassia, their differentiation and efficacy.

Section VI, "Physiology and Etiology," had a report by Dr. H. A. Smith, chairman of the section, on "*Dental Implantation.*"

This paper contains tabulated records of implantations by Dr. Hugenschmidt, of France, by Dr. Younger, of San Francisco, and Dr. Ottofy, of Chicago. It is a valuable contribution to the literature of that operation. The discussion on this subject was quite animated and interesting. It proved the old maxim, however, that doctors disagree. One ascribes his failures to the very conditions that another considers as requisite to success in his hands, which proves to the honest and earnest investigator, that neither failure nor success depend upon the causes suspected, but that the matter must be studied further.

A paper by Dr. E. S. Talbot, a member of the section, on "*Classification of Typical Irregularities of the Maxilla and Teeth,*" was also offered by Section VI.

This paper is illustrated by a number of diagrams, and is another valuable contribution by its author in the line of a subject on which his reputation is so well established. In the discussion on the same, one of the gentlemen remarked that the extent of the information set forth by the paper and the drawings was to prove the existence of those irregularities, and that they are capable of being classified, but that the cause and the prevention of its effect is what we are particularly interested in. Will not Dr. Talbot make this his particular study?

A communication from Dr. Ottofy, of the "Committee on Tabulation of the Condition of the Pre-historic Crania" of the Illinois State Society, was also presented by this section. In this it was stated that probably \$2,000 would be necessary to properly do the work, and that the State societies of Illinois, Kentucky, California and Georgia had subscribed \$100, \$50, \$50 and \$25 respectively. After discussion, \$500 was appropriated to assist in this research. In this discussion Dr. Barrett mildly quotes the words of Rip Van Winkle, "And are we so soon forgotten when we are gone?" and applies them to himself. With his well-known modesty he called attention to the work done by himself in that line in the museum of archæology at Cambridge, and his published paper in the *Independ-*



ent Practitioner for 1883, which received recognition from Harvard University.

Section VII, embracing Anatomy, Pathology and Surgery, offered a paper by Dr. Brophy, its Chairman, on "Lesions of the Dental Branch of the 5th Pair of Nerves."

The paper is illustrated by cuts of four maxillæ. One at birth, one at puberty, one of an adult, and one of old age, with special reference to the location of the mental foramen. And attention is called to irritations upon the dental nerves at this location by artificial dentures. A case of surgical interference in persistent neuralgia is described by the author.

Section II, "Dental Education, Literature and Nomenclature," reported through its Secretary, Dr. Ottofy.

From this it appears there are now thirty-one colleges in this country which graduated 796 dentists during the preceding year, or 2,642 in the last four years.

A paper entitled "*Some thoughts on Education*," by Dr. Chas. B. Atkinson, was also offered by this section. It is full of thoughts worthy of careful digestion and capable of practical application.

The same section also offered a paper by Dr. M. G. Jenison, entitled "*Oral Surgery, and Who Should Perform It*."

The answer is: The skilled dentist, especially well posted in anatomy and pathology.

A paper by Dr. Louis Jack, on "*The Necessity for Independent Dental Journalism*" was also offered by section II. It is a brief yet elaborate and skillfully handled argument in advocacy of a divorce of our journalism from the dental supply houses.

Section III, on "*Operative Dentistry*," made its report through Dr. Hoff, the Secretary. They presented several papers: "*Some Methods of Regulating Teeth*," by Dr. V. H. Jackson. This paper, illustrated by numerous cuts, presents a new form of piano-wire springs. A paper by Dr. Geo. B. Watkins, of the Section, entitled, "*A Practical Case of Regulating*," also a paper on "*Glass as a Filling Material*," by Dr. Herbst, of Germany. This paper describes the method of making the glass inlays and manner of placing them.

A lengthy discussion, in fact the most animated discussion of the session, followed the report of this section. Singularly enough, the subject was confined almost exclusively to root filling. The key-note to this was given by a paper which advocated the use of

carbolized cosmoline and cotton as a suitable root filling. The paper itself was placed in the association's index expurgatorium.

The last section to report was Section I, on "Prosthetic Dentistry, Chemistry and Metallurgy." It reported verbally through its Secretary, Dr. Ames, on movable bridges, presented by Dr. Curtis, of Syracuse, and Dr. Winder, of Baltimore, calling the attention of the association to their novel features. The entire volume covers some 160 pages. It will be valuable for reference in the library of every reading and thinking dentist. C. R. E. K.

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ORTHODONTIA OR MALPOSITION OF THE HUMAN TEETH. ITS PREVENTION AND REMEDY. By S. H. Guilford, A. M., D. D. S., Ph. D., Professor of Operative and Prosthetic Dentistry in the Philadelphia Dental College; author of "Nitrous Oxide," etc., Philadelphia. The S. S. White Dental Mfg Co., sole agents. Price, \$1.75.

This is another of the text books prepared for use in schools, represented in the National Association of Dental Faculties, and at the meeting of that body held at Saratoga last August, it was formally accepted.

We have in this little book an admirable and safe guide for the treatment of irregularities.

Part 1st, treats of the principles involved. It defines the subject, gives the etiology, enumerates the evils associated with irregularity, discusses the advisability of correction, and the age at which correction may be begun. It devotes a chapter to the consideration of the movements to be produced and principles governing the application of force.

Sound advice is offered as to extractions in its relation to orthodontia. The physiology of tooth movement and character of tissues involved, is clearly and concisely set forth.

The treatment of these subjects occupies fewer than fifty pages, and the author is to be complimented upon his success in getting at the pith of things so briefly and efficiently. The advice given as to the management of the temporary teeth and their influence upon the position their successors are to occupy, is sound and should have emphatic utterance in our schools. Perhaps the evils resulting from non-correction of irregularities, are somewhat exaggerated, a conviction rather to be desired than otherwise, and not unlooked for in the zealous specialist.

The author maintains his scientific reputation by basing his physiology and anatomy of the peridental membrane upon Dr. Black's investigations into these tissues, first published in Vol. I of the DENTAL REVIEW.

Part II is devoted to materials and methods, in which is taught the manner of studying a case and "going about it." The consideration of appliances and methods to be used. Here follows a description of the methods and appliances originated or employed by men prominent in this department of dental surgery. Farrar, Patrick, Byrnes, Magill, Angle, Coffin, Talbot, the author, *et al.* This portion of the book is well illustrated by cuts, which will serve as excellent working drawings.

Part III describes specific forms of irregularity and their treatment. While the book contains little which is not familiar to all who are abreast with the times, yet it embodies all the best knowledge on the subject of orthodontia, freed from obsolete teaching. The author's literary style and his manner of arranging the subjects is worthy the emulation of dental writers. It is a book we can heartily recommend to student and practitioner, and creditable alike to the author, college faculty, Association, and the dental profession.

#### BOOKS RECEIVED.

A COMPEND OF MATERIA MEDICA, THERAPEUTICS AND PRESCRIPTION WRITING. By Samuel O. L. Potter, M. A., M. D. Fifth edition. Philadelphia: P. Blakiston, Son & Co., 1889. Price, \$1.

A PRACTICAL TREATISE ON ARTIFICIAL CROWN AND BRIDGE WORK. By. Geo. Evans. Second edition. Revised and enlarged with 547 illustrations. Philadelphia: The S. S. White Dental Manufacturing Company, 1889.

#### PAMPHLETS RECEIVED.

The Philosophy of Eating and Drinking, from a Dental and Medical Standpoint, with Personal Experiences. By W. G. A. Bonwill, D. D. S. Philadelphia: 1889. Pages, 21.



## PRACTICAL NOTES.

## HYPER-CEMENTOSIS—A CASE IN PRACTICE.

BY J. AUSTIN DUNN, D. D. S., CHICAGO., ILL.

Miss M. called on me for diagnosis and relief from what appeared to be some disease of the roots of a second lower molar, right side, with fistulous opening over the roots. After listening to her "story" and experience extending over a period of nine years, I decided that it was a case of hyper-cementosis, so-called exostosis, with the posterior and anterior roots of the two teeth joined.

She says: "In 1879 I called on my dentist to have several teeth extracted; all were successfully removed, excepting this lower one, the crown breaking off. The gum seemed to heal over, but I experienced constant dull pain for nearly two years, when the tooth was examined and an attempt made to extract, with failure; the dentist was not sure what it was. In about six months another attempt was made to extract, with failure, by another dentist, only a small piece coming away, with belief that nothing more remained. Intermittent dull pains still continued, with no suppuration. In about one year another attempt was made to extract by dentist No. 3, with failure; he thought it to be a root at first and finally did not know what it was. In six months more another attempt was made to extract, with failure, by dentist No. 4. I stood it for about one year and a half, when another attempt was made to extract, with failure, by dentist No. 5; he thought it might be a piece of jaw bone. In 1884 two attempts were made to extract by different dentists, with failure, not knowing what was in the jaw; at this time I noticed a discharge from a little opening over the roots, the pain continuing as before. Several weeks after the last attempt went to dentist No. 7 who would do nothing. After waiting two or three weeks went to dentist No. 8; he thought it a root and attempted to extract, with failure.

Since this last failure to extract the pain has been more steady and at times acute, with occasional swelling and discharge over the root.

Both my father and brother have had teeth extracted in pairs."

The strange part of this case, is that eight different dentists should fail of diagnosis, and that they should attempt to extract in the usual way, whether they knew the character of the case or not. The roots were "cemented" together and to the root of the wis-

dom tooth, set deeply in the jaw bone proper, making it impossible to extract with forceps. It might have been removed by sacrificing a sound and *very* useful tooth, which the lady begged me to save if possible, and so I decided and readily removed the root by the aid of the dental engine and large sharp burs, saving a good tooth and most of the hard and soft tissues and giving but little pain. The pain with which she had suffered so long gradually ceased and the wound healed naturally.

And this reminds me that I have occasionally facilitated the extraction of impacted teeth, especially the third molar, by the use of the dental engine and burs. A 10 per cent ethereal solution of cocaine or Dr. Barr's local anæsthetic may be used so as to make the operation almost painless.

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#### ETHICS, PROFESSIONAL AND OTHERWISE.

The very laudable desire of members of the dental profession to elevate it to the highest plane possible, is sometimes manifested in ways that seem unlikely to produce such a result.

Claiming for dentistry the status of a liberal profession, equal in honor, and to be governed by the same high standard of ethics as the medical profession, they are worthy for all credit for their efforts, and when their efforts are properly directed all men will aid by their sympathy if unable to do more active service in the work.

To require a higher standard for general and professional education, and a strict observance of the ethical code adopted by the dental societies, would seem to be in the right line of effort and within the unquestionable right of the profession.

If in this code it shall be declared that it is improper for a dentist either to keep for use in his own practice exclusively, or to patent and sell to others any inventions or discoveries he may make, that is a matter for the profession to consider and settle for themselves, and so in general of all matters relating to the practice of dentistry. As we say of the individual, he should have entire freedom so long as he does not interfere with the rights of others, so an association of individuals may act with the same freedom under the same limitations.

It is only when an association, disregarding this limit, endeavors to make rules of action adopted for its own government, the law for others, that it is open to adverse criticism.

Much has been said and written in regard to the impropriety of dental patents, secured by dentists, and by sale or otherwise made a source of revenue to the inventor.

It would seem to be not difficult to define the rights of the individual in this matter. If he has voluntarily become a member of a dental society he is in honor bound to abide by its rules or to withdraw from membership, and, on the other hand, members of the society may properly refuse to recognize professionally those they believe to be acting in a manner adverse to the interests of the profession.

But when the dentists go beyond this, and practically claim the right to establish a code of ethics for those engaged in an entirely different occupation, they invite a like interference with, or at least criticism of, their own acts. There has been much sharp denunciation of dealers in dental goods because of an association formed by them, also of certain manufacturers because of their purchasing patents and in various ways so managing their business as to make it the most profitable to themselves.

While trusts are multiplying, and are made for the acknowledged purpose of preventing competition, controlling production and advancing prices, it is gratifying to know that this Dental Trade Association has no power to prevent competition, limit production, or fix prices, and without such power it is certainly not much to be feared by the public.

Manufacturers and dealers in goods of all kinds do business for profit in hard cash, and the struggle for success is always sharp and often unsuccessful. Much work in every branch of business is done without profit, and yet this part cannot be rejected, as it is essential to retain the other. The grocer who should refuse to sell sugar because there is no profit in it would soon find his customers going elsewhere for other goods besides sugar.

Under these conditions it is necessary that opportunities to deal in the more profitable goods should not be neglected, and when the dentist has invented a good thing, and offers it for sale, the manufacturer will, of course, buy it if he sees or thinks he sees the opportunity to make a good profit out of it. This would appear to be only proper business enterprise, but it is not always successful, as many an inventor has received a liberal sum for his patent which returned little or nothing to the buyer.

Now, to be just in this matter, the dentist should recognize the



fact that manufacturers and dealers do not claim to be in one of the liberal professions, they do not pursue their business on benevolent or merely humanitarian lines; they buy or make goods as low as they can and sell them at as good profit as their competing neighbors will permit. They certainly fill an important place in the industrial organizations, and are entitled to a fair compensation for their work.

I do not purpose to criticise the code of ethics, or the practice of the dental profession because, however iron clad the code may be, or however much it may limit individual action, it is a matter for its members to care for, so long as it does not interfere with the rights or welfare of those outside its lines; but it seems rather strange that so many dentists should prefer to be tolerated attachèes of the medical profession rather than to maintain their own dignity by claiming to be only what their diplomas declare them—Doctors of Dental Surgery. The more advanced thinkers and best educated men in the profession fully recognize the intimate relations and interdependence of all parts of the human system, and a necessity for a careful study of each in its relation to all, in order to treat its abnormal conditions intelligently and with reasonable hope of success.

This leads to the recognition of the necessity for a broader education and a fuller preparation for the practice of dental surgery, and medicine.

The rapid advance made in dentistry, both in educational standards and in practice, in the last twenty-five years is sufficient guarantee that in years to come the advance will go on until the degree of D. D. S. will stand for as much in liberal education and skillful manipulation as M. D. does for the surgeon and physician; and looking forward to that result, would it not be better to wait and work for it rather than make an entangling alliance with another profession by which independent action would be forever limited.

NEMO.

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#### AN OBSCURE CASE OF TOOTHACHE.

BY SMILAX.

A lady, sixty years of age, complained of pain in the left superior lateral incisor. The pulp was inflamed. After depletion and destruction the root was filled. The pain did not subside. The gum was blistered, but to no avail. The pain would not yield to

any local application. Finally, as the patient became exhausted from loss of sleep, the tooth was extracted and a *strawberry seed* came with the root. This seed had been forced nearly to apex of the root between the lateral incisor and cuspid, and had made a place for itself in the peridental membrane. The root was found to be well filled to the apex with gutta-percha.

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### RANULA AND ENLARGEMENT OF SUBMAXILLARY GLAND.

BY H. E. FOX, D. D. S., BESSEMER, MICH.

June 1st, 1889, Mr. Alex Strum, aged 35, consulted me in regard to what he called a swelling of the lower jaw.

About ten or eleven months prior to the consultation, while eating dinner, there was a sudden enlargement under the tongue.

The patient, thinking there was nothing serious, paid little attention to it for a month. The swelling became larger and larger until he lost the use of his tongue in speech.

He applied to a physician who lanced the swelling, which reduced it at once; but in a few days the swelling was as large as ever. The lancing and reduction of swelling was repeated for the fourth time, after which the whole neck became sore, inflamed and began to swell. The patient was alarmed and discontinued visiting the physician.

Upon examination I found a Ranula and an enlargement of the sub-maxillary gland, caused by a stoppage of the ducts leading from the sub-maxillary and sub-lingual glands.

I at once took a curved needle and dipped it into 95 per cent carbolic acid to disinfect it. After threading the needle with silk floss, I inserted it near the symphysis and directed it under the membrane deep enough to enter the sac which held the secretion, thence to the surface three-fourths of an inch from the point of insertion. I then took hold of the ends of the silk, pulled up until I could cut out the piece of tissue between the threads; this gave egress to the secretion in the sack, which ran out in abundance and let the swelling subside under the tongue.

But the sub-maxillary gland was as yet in the same condition. The secretion in the Ranula was like a bloody mucus or venous blood. After subsidence of hæmorrhage, the cavity was washed out with peroxide of hydrogen.

I then tried to find the mouth of Wharton's duct, but could not.

I took a piece of silver nitrate, fastened it in a stick of wax and applied it to the inner walls of the Ranula.

A pellet of cotton, moistened in oil of cassia, was inserted into the cavity and the patient told to return next morning.

The second treatment was begun by applying pressure to Wharton's duct, which gave way and discharged the secretion of the sublingual gland.

Upon examination, to my surprise, the secretion presented a calculus about the size and shape of a match three-quarters of an inch long, which had acted as a thrombus.

Peroxide of hydrogen was injected into the opening and allowed to remain five minutes; then the opening was treated to bichloride of mercury 1 to 5,000 water, and the oil of cassia dressing repeated after placing a pellet of cotton in the cavity of the Ranula.

I then painted the external surface of the jaw about the submaxillary gland with iodine and advised the patient to repeat the painting twice a day. The dressing was changed daily until the walls of the Ranula had sloughed and filled with granulations.

Daily antiseptic washings were given and the passage kept open with a piece of wax, with a knob on the inner end to keep it in place.

In the center of the wax was inserted a platinum tube for the secretion to pass out.

At first the patient complained of a salty taste of the secretions on that side of the mouth. He was discharged in three weeks.

I saw him to-day and his neck is perfectly normal in size, and he says he is as well as ever.

November 11, 1889.

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### MEMORANDA.

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In the report of a surgical clinic by Dr. T. L. Gilmer, published on page 753 last month, through an oversight on the part of the proof-reader, the following errors occurred; In line 15, mylo-hyoid should be *gustatory*. In line 14, action should read *ex-section*. As the operation was one of *ex-section*, wherever the word "resection" or "section" occurs, the word *ex-section* should be substituted.

The Board of Directors of the Dental Protective Association of the United States re-elected the following named officers: President, J. N. Crouse; Vice-President, T. W. Brophy; Secretary and Treasurer, E. D. Swain.

Dr. Edwin T. Darby, of Philadelphia, has been disabled by an injury to his knee, caused by the stumbling of his saddle-horse. He has been confined to his room for five weeks.



## TAKING HIM AT HIS WORD.

Dentist—"It will be over so quickly you will hardly feel it, Tommy, and you'll be at least \$10 better off when you can hold that tooth in your hand and look at it."

Tommy (looking at it a few moments later)—"I think I'll keep the half dollar papa gave me to pay you, doctor. That tooth's worth \$10, but you can have it for pullin' it. Well, I must go."

Metropolitan College of Dental Surgery and Infirmary at Chicago: To inaugurate a better system of teaching dental surgery; capital stock, \$5,000; incorporators, A. M. Rivenburg, G. F. Schaefer, and W. F. McWhinney.

## ANNUAL PROGRAMME OF THE ODONTOLOGICAL SOCIETY OF CINCINNATI FOR 1889-90.

Regular meetings on the fourth Tuesday of each month. Officers: Dr. M. H. Fletcher, President; Dr. Grant Mollyneaux, Vice President; Dr. W. M. Williams, Secretary. Board of Trustees: Dr. D. W. Clancey, chairman; Dr. H. L. Moore, Treasurer; Dr. J. S. Cassidy, Dr. W. D. Phillips, Dr. H. A. Smith. Committee on Programme: Dr. M. H. Fletcher, chairman; Dr. D. W. Clancey, Dr. W. M. Williams. Programme: Voluntary papers, clinics and incidents of office practice at each meeting; January 28, "Quacks," Dr. W. M. Williams; February 25, "Imagination," Dr. J. R. Callahan; March 25, "Intimate Diagnosis of Lesions Affecting the Teeth," Dr. Frank W. Sage; April 22, "Etiology of Dental Caries," Dr. H. A. Smith; election of officers at this meeting; May 27, "Vulcanite Plates," Dr. Grant Mollyneaux; "Diseases of the Teeth and their Effects on Constitutional Conditions," Dr. C. H. Martin; June 24, "Histology of Repair in Animal Tissue," Dr. M. H. Fletcher. Society adjourns to October, 1890.

## TO THE EDITOR OF THE DENTAL REVIEW:

DEAR SIR.—Dr. E. J. Perry, in his article on diseases of the peridental membrane, says that he removes serulal calculus after having treated the gums three or four times with 1, 2, 3.

I am unable to understand why he uses an antiseptic stimulant before removing the calculus. I believe it would be better to remove, at first sitting, all calculus possible; then commence treating gums with 1, 2, 3, or some other suitable remedy. At each subsequent treatment remove remaining particles of calculus. What is the etymology of "antiseptisize."

Very truly yours,

Valparaiso, Ind.

JAMES R. PAGIN.

## DENTISTS AT DINNER.

The annual dinner of the staff and past and present students of the Dental Hospital and School of Dental Surgery, took place at the Holborn Restaurant, on Saturday evening. Mr. Christopher Heath, F. R. C. S., occupied the chair, and was supported by a large number of eminent physicians and surgeons and members of the dental profession. Mr. J. S. Turner, in proposing the toast of the Dental Hospital of London and staff, mentioned that there appear on the record 13,000 cases of extraction for the last year. There were also nearly 10,000 cases of extraction under nitrous oxide gas, and it was greatly to the credit of the gentlemen who administered this gas that they rendered their services to the Hospital without remuneration. The Hospital was only tolerably well supported by the

public, but very well supported by the medical and dental professions. Mr. R. H. Woodhouse replied.—*N. Y. Herald*, LONDON EDITION.

Our esteemed friend, the editor of *L'Odontologie*, in reproducing a portion of the biographical notice of Prof. James Truman, taken from the *Items of Interest*, headed it NECROLOGICAL. Prof. Truman, we are happy to say, is still in the land of the living, and we hope he will continue in good health for many years to come.

If the users of wood points for root-filling could only have their clients return to them to have the abscesses treated we would not be the walking skeleton we are at present. Abscesses do not heal spontaneously after a root has been filled with wood. The wood must be removed, and what a task it is, especially when it is cut off short. Would that you would not use wood, and there wouldn't be so much good wood spoiled. Selah!

Narrow strips of corset steel may be made into broaches. The temper is good and the steel is tough.

#### PENNSYLVANIA STATE DENTAL SOCIETY.

President, J. C. M. Hamilton, Tyrone, Pa.; 1st Vice-President, Frank L. Bassett, Philadelphia, Pa.; 2d Vice President, J. N. Wamer, Wilkesbarre, Pa.; Recording Secretary, C. V. Kratzer, Reading, Pa.; Assistant Secretary, R. B. Cummins, Blairsville, Pa.; Corresponding Secretary, L. Ashley Faught, Philadelphia, Pa.; Treasurer, G. W. Klump, Williamsport, Pa.; State Examining Board, Dr. W. E. Magill, President; J. C. Green, Secretary; C. S. Beck, W. E. Van Orsdel, Ed. C. Kirk.

#### EASTERN ILLINOIS DENTAL SOCIETY.

The Eastern Illinois Dental Society will meet in Mattoon, Illinois, on the third Tuesday in March, 1890. All members are urgently requested to be present.

I. A. LUMPKIN, Secretary,

#### CHICAGO DENTAL SOCIETY.—TWENTY-SIXTH ANNIVERSARY, FEBRUARY 4TH, 1890.

The Chicago Dental Society will devote one day to clinics and the reading of essays and will terminate the exercises with a dinner at the Leland Hotel. An interesting and instructive programme is in process of preparation and printed announcements will be published within a few days. Among the novel features of the meeting will be an exhibition of all kinds of electrical appliances used by dentists. The exhibit will be made by three of the best known dentists of Chicago, who make a specialty of constructing this kind of appliances. Two companion papers, one "The Correct" and one on "The Fallacious Theories and Practices of the Dentist of the Present." While an exceptional feature of the meeting will be a symposium on Veterinary Dental Science, by the leading veterinarians of Chicago. A series of brief papers on veterinary dental anatomy, histology, physiology, pathology, surgery and operative dentistry will be read by professors of the Chicago Veterinary College. The clinics will be held from 9 to 12 A. M. at 122 Wabash avenue; the afternoon session will be held at the Ethical Society rooms, 45 Randolph street, from 2:30 to 6 P. M. Dinner at the Leland Hotel at 6:30 P. M.

# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, FEBRUARY 15, 1890.

No. 2.

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## ORIGINAL COMMUNICATIONS.

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### THE ETIOLOGY OF DENTAL CARIES.\*

BY EDMUND NOYES, D. D. S., CHICAGO.

The exciting or immediate causes of dental caries have been the subject of almost endless speculation, controversy and investigation, with rather meager results of scientific knowledge till quite recently. During the past eight or ten years the studies and experiments of Dr. W. D. Miller and others, have given us a series of facts and theories which may fairly be regarded as furnishing a scientific explanation of the etiology of caries that seems likely to stand the test of time, though it is highly probable that future investigations may show that other active agencies often assist in these destructive processes besides those already demonstrated. It is not to be expected that the profession, generally, should at once understand or accept conclusions derived from such a series of investigations, or that they should escape denial, controversy and much discussion from thinkers and writers upon the subject.

It is evident from what has been published, that very many do not yet understand the facts which have been ascertained, nor the conclusions which are logically derived from them. Especially is this the case with reference to the action of living organisms, sometimes spoken of as the "germ theory of caries." The notion seems to have been widespread, and perhaps it is still, that the micro-organisms are of the nature of little animals which eat up the teeth. They really belong to the very lowest order of unicellular plants.

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\* Read before the Odontological Society of Chicago, Jan. 21, 1890.



Others have supposed them to be produced by fermentation and putrefaction instead of being themselves the active causes of those processes.

Perhaps no further apology is needed for writing a paper which can make no claim to originality of the facts or theories described, and will only attempt to set forth briefly the essential particulars relating to the subject, as they appear to the writer, in such a way as may help to correct some of the more common errors and misconceptions respecting it.

It appears necessary at the very beginning to get rid of the notion that micro-organisms devour the teeth directly, in the first stages of caries. There is nothing incredible in the supposition that there may be some parasites whose digestive fluid can dissolve the lime salts of enamel and dentine, no more than there is in the well-known fact that the roots of certain plants will produce a digestive fluid capable of dissolving hard marble, so that if planted in shallow sand over a polished slab the marble will be etched in a pattern representing the net-work of plant roots spread over its surface.

Dr. Miller, in an article in the *Cosmos*, January, 1883, describes and illustrates an organism which appears to do that, cutting through the dentine in lines which cross the tubuli instead of following them, but although he says that he has fifteen specimens of it, he adds: "So far as my observation at present extends, I would not be willing to say that its occurrence in the human mouth was general enough to make it an important factor in the caries of the human teeth."

I am not aware that Dr. Miller has referred to it again in his subsequent writings, and Dr. Black writes to me that he has been unable to find any specimens showing its action, though he has searched for them. It may, therefore, be left out of the account for the present, as one of the *constant* factors in dental decay, and in the ordinary occurrence of that disease it may be safely said that the lime-salts of enamel and dentine are neither food nor soil for the nourishment of microbes. After decalcification, the remaining portion of dentine is digested more or less by parasites of various sorts, which is about the same thing as saying that it is destroyed by putrefaction.

Notwithstanding the exception just noted, the micro-organisms found in contact with the teeth and in carious cavities, subsist for

the most part upon other material than the substance of the teeth and are found in those localities because the particles of food, etc., upon which they do subsist, become lodged there.

The organisms reponsible for the production of dental caries are the ones that cause fermentations and putrefactions. It is the acid products of the fermentations which are solvents for the phosphate and carbonate of lime of the teeth.

The "germ theory" of caries is not inconsistent with the "chemical theory." The investigations of Dr. Miller and others, having had for their object the discovery of the particular chemical agents concerned in the destruction of the dental tissues, and the manner and locality of their production.

For patients and non-professional people, as good an explanation as any, for the active causes of caries, is the statement that particles of food, especially such as contain sugar or starch, which find a lodgment in contact with the teeth, or in crevices caused by imperfections in the enamel, quickly undergo an acid fermentation, and the lime-salts of the enamel and dentine are dissolved by the acids thus produced.

This action is strictly localized, the acid being produced in immediate contact with the enamel or dentine which is dissolved by it, and within the carious cavity as soon as sufficient progress has been made to form one. The general condition of the fluids of the mouth may be either acid, or alkaline, or neutral, and may be such as to promote, or diminish, or possibly to prevent the localized fermentations described, but the condition of the oral fluids throughout the mouth will not in any case furnish a satisfactory explanation of the phenomena seen in dental caries.

For professional readers a more detailed account is necessary. Fermentation is a vital process rather than a chemical one; that is to say, the processes of fermentation do not take place without the agency of living organisms. The yeast plant effects the vinous or alcoholic fermentation; the products of it being alcohol and carbon-dioxide; and the lactic acid, acetic acid, and other fermentations, are caused by living organisms peculiar to each. The different forms of putrefaction are closely similar in their processes to the fermentations, of course being caused by different species and acting upon different materials, the term putrefaction being applied to the decomposition of nitrogenous substances with the production of ill-smelling gases as part of the results. The lactic acid

fermentation is the one most fully demonstrated as always active in the production of dental caries, but it is almost certain that other forms of fermentation and putrefaction are often present.

The process of fermentation need not be here described except very briefly. The lactic acid ferment, or the various forms of caries fungi, like all living things, require a certain amount of nitrogenous material for tissue-building, and readily find it, associated with the starch and sugar which form their principal food. Those penetrating deeply into the partly decalcified substance of the dentine, and into the tubuli, may probably digest the organic portion of the dentine and the tubuli contents for that purpose, but their principal food appears to be glucose, which they find ready prepared by the action of the ptyalin of the saliva on the starchy particles of food, and are also, in all probability, by their own digestive fluid, able to convert cane sugar and starch into glucose for themselves. The conversion of the glucose into lactic acid by the vital activity of the plant is the characteristic and essential phenomenon of lactic acid fermentation, and this is the province of living organisms in relation to the first stage of dental caries.

All living things may be poisoned, and have their vital activities suspended by the accumulation of their waste products, and though scientific men are not yet quite agreed as to whether the products of fermentation are the waste products of the ferment organisms, and some excellent authorities believe that supposition impossible, yet all agree that the vital activities of the plants are suspended or destroyed by their accumulation in sufficient strength, in the same way as might be expected if they were true waste products. But in the case under consideration this is effectually prevented by the combination of the lactic acid with the lime salts of the teeth as fast as produced, or by its dilution in the fluids of the mouth. The effect upon the teeth of these acids produced by fermentation, is a chemical decomposition purely, and is not a vital action at all.

While the destructive action is confined to the enamel, its progress is much slower than subsequently, because of the great density of the material, which not only offers a greater proportionate amount of lime salts to be dissolved, but does not admit of any appreciable percolation of the acid into its substance, much less the penetration of any of the acid-producing organisms. It presents a practically solid wall to be dissolved from the surface only. When



the dentine is reached, the case becomes very different. Its structure, in the form of tubes which allow the acid, and also the acid-producing fungi, to find their way into them, causes a very greatly increased surface to be presented to the action of the acids, and sufficiently explains why caries is so much more rapid in dentine than enamel. It may be asked how the organisms can live in the deep portions of only partly softened dentine, and how they obtain sugar in such situations. As for the latter, it is evident that a solution of sugar can penetrate as deeply into the porous dentine as the organisms can, and the evidence thus far produced appears to show that the caries fungus lives either with or without free access of oxygen.

The strict localization of this disease, and the causes that produce it, must not be lost sight of. The fermentations take place, and the acids are produced, at the very spot where the caries begins, and within the cavity as soon as one is formed. It matters but little, in many cases, what the general condition of the mouth may be, as regards acidity or alkalinity, still less after a cavity is formed than at first.

These circumstances, of strict localization and the formations of acids by fermentation, were asserted as long ago as 1835 by Robertson in England, and in 1838 by Regnard in France, and it seems strange that they should have been so nearly lost sight of during about fifty years of study and investigation of the subject.

The proof of the facts enumerated as constituting a part at least of the true etiology of dental caries, consists of carefully conducted experiments and observations which cannot be met by a general denial or disbelief, but must be accepted, unless equally careful examinations and tests shall result in discrediting the facts or showing that they require a different interpretation.

The microscope shows certain living forms always present in carious dentine.

That they are alive is proven by their growth when transferred from the deep layers of carious dentine to a proper culture medium, which soon becomes filled with them, and a few drops of this will start the growth of a fresh culture and so on indefinitely. That they cause fermentation is shown by the fluid in which they grow quickly becoming acid (if it contains sugar), while the same fluid not infected with these organisms remains free from acid. (It should be noted particularly that the caries fungus will live and

grow, though less vigorously than usual, in a pure beef broth destitute of sugar or starch ; but in such circumstances there is no production of any acid ; in other words there is no fermentation for lack of any fermentable material. The addition of a little sugar or starch to such a culture is quickly followed by acidity.) That lactic acid is the product of at least one of these fermentations has been shown by the appropriate tests, and by the identification of lactate of lime in carious dentine.

That they, as well as putrefactive organisms, dissolve the decalcified dentine, is shown by their power to liquefy gelatine and coagulated albumen, as well as by observation of their action upon decalcified dentine itself.

Another form of proof that this etiology of caries is correct, is found in the production of it artificially in solutions of sugar in beef broth, which cannot be distinguished in any manner from that taking place in the mouth.

This much appears to be established : that the first stage of caries, consisting in the decalcification of the enamel and dentine, is effected by acids produced by fermentation, lactic acid being the one most clearly identified and proven, and that the later stage—the destruction of the organic portion of the dentine—is effected by fermentation and putrefaction, it having been shown that both classes of organisms have power to liquify gelatine, and also that either can dissolve the organic portion of dentine after its lime salts have been removed.

It is not claimed by any one, I think, that our knowledge of the etiology of dental caries is complete. It is almost certain that other forms of fermentation besides the lactic will be more fully identified and demonstrated than has yet been done, and it is highly probable that other destructive agents besides the organic acids will be found to take part in it.

Dr. Geo. Watt many years ago perceived clearly the strict localization of the causes, as well as the phenomena of dental caries, and, in explanation, advanced the theory that the decomposition of the various matters lodged about the teeth gives rise, in different circumstances, to nitric, sulphuric and hydrochloric acids, which act upon the teeth in their nascent condition. He maintains that opinion to the present time, and appears to think it sustained by sufficient evidence, but I have never been able to find out what experimental proof has been attempted, nor any account of work

to that end in such detail as to enable a judgment of its value, or to guide any one in an attempt to repeat or verify the proof.

Caries is not the only form of destruction to which the hard structures of the teeth are occasionally liable, though it is the most important, the most frequent, and usually of longest duration.

Teeth are sometimes dissolved by a process that appears to be a true absorption, closely similar to that by which the roots of deciduous teeth are removed, and by which the osteoclast cells dissolve bone in the changes required by its growth, or by which small portions of necrosed bone are sometimes dissolved and removed. It requires actual contact of the connective tissue of the gum, and the gum grows into the cavity as fast as formed, thus maintaining contact or else the absorption ceases. If this happens, by the recession of the gum, the absorption cavity becomes at once infected with true caries, so that one form of destruction is succeeded by the other.

It seems probable that the enamel of erupting teeth may occasionally receive injury by the absorption process, causing the horizontal furrows across or around the teeth similar in appearance to those caused by interrupted development of the enamel. The solvent in these cases is provided by the connective tissue cells, probably in some abnormal condition, or under some unusual irritation, but I am not aware that any investigations have yet determined the nature of it, or even whether it is acid, alkaline or neutral.

What is called erosion is another form of destruction to which teeth are occasionally liable, the etiology of which has thus far been the subject of conjecture and speculation rather than proof, though some circumstances noticeable in many cases point to the probability that it is caused by acidity of the mucus secretion of those portions of the lips, the gums, or the tongue, which are oftenest in contact or closely contiguous to the eroded surfaces.

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#### NITRIFICATION.\*

BY G. V. BLACK, M. D., D. D. S., JACKSONVILLE, ILL.

Touching the question of nitrification, or the production of nitric acid and the nitrates in the processes of decomposition, we find the best studies of the subject have been in connection with

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\* Supplement to Dr. Noyes' paper.



agricultural chemistry. This is for reasons that will appear in the following quotation from an article by Prof. Parr, Illinois Horticultural Reports, vol. 21, page 185 :

“The two sources of food supply (for plants) are the air and soil. In general, we may say that the plant, if we were to burn it, would in that process give up to the air those elements it received from the air as food, while in the ashes would remain those food elements it receives from the soil. Among these latter we have to deal at present with one only, and that is nitrogen—an essential element, and without which no plant can live. Moreover, this nitrogen, besides being taken up by the roots, can only be utilized by them when in a nitrate form, as we find it in such salts as nitre, or calcium, or ammonium nitrate. In other words, the nitrogen, combined as it is in undecayed vegetable or albuminous matter, or in the form of ammonia, no matter how abundant, can in no degree be utilized by the plant as food. Now, the question arises, what is the form of supply of this nitrate form of plant food? Any of these nitrate salts are highly soluble, and are being constantly leached out of the soil, so that there must be some constantly renewed source of supply. Theories on this point are numerous. Four-fifths of the atmosphere is pure nitrogen, but not in the plant food condition. Unquestionably the electrical discharges during thunder storms serve to oxidize some nitrogen, which is thus carried down by the rain within reach of the plant roots. But this supply is but a minute fraction of the demand, so we are obliged to look elsewhere for the source of our nitrates.”

From this it will appear that there has been the strongest incentive to the study of the subject of nitrification ever since the discovery of the necessity of these salts in tilled earths. This dates back to the beginning of this century at least, and some of the most noted men of the world have given it their earnest attention; so that, in the aggregate, there is an immense literature on the subject. I am sorry, however, that I must add that this literature is almost as indefinite as abundant, when we seek to know the essential process of the production of nitric acid in nature. A very few quotations will give us, practically, all that is yet known. The following will serve as a summary:

## LIEBIG'S AGRICULTURAL CHEMISTRY, PAGE 102.

\* \* \* When moist azotised animal matter is exposed to the action of the air, ammonia is always liberated ; nitric acid is never formed. But when alkalies or alkaline bases are present, a union of oxygen with the nitrogen takes place under the same circumstances, and nitrates are formed together with the other products of oxidation. \* \* \*

The most distinguished philosophers suppose that the nitrogen in an animal substance, when exposed to the action of the air, water, alkaline bases, obtains the power to unite directly with oxygen, and form nitric acid ; but we are not acquainted with a single fact which justifies this opinion. It is only by the interposition of a large quantity of hydrogen in the state of combustion or oxidation, that nitrogen can be converted into an oxide. \* \* \*

On the other hand, we find that ammonia (a compound of hydrogen and nitrogen), cannot be exposed to the action of oxygen (in the presence of alkaline bases), without the formation of an oxide of nitrogen, and in consequence the production of nitric acid. \* \* \*

Eremacausis is a kind of putrefaction, differing from the common process of putrefaction only in the part which the oxygen of the air plays in the transformations of the body in decay. When this is remembered, and when it is considered that in the transaction of the elements of azotised bodies their nitrogen assumes the form of ammonia, and that in this form, nitrogen possesses a much greater disposition to unite with oxygen than it has in any of its other compounds. We can with difficulty resist the conclusion that ammonia is the general cause of nitrification on the surface of the earth.

Azotized animal matter is not, therefore, the immediate cause of nitrification ; it contributes to the production of nitric acid only in so far as it is a slow and continued source of ammonia. \* \* \*

## REGNAULT'S CHEMISTRY, VOL. I, PAGE 454.

\* \* \* \* We have said that nitre was formed in nature. In many hot countries, principally in India and Egypt, a copious saline efflorescence is observed on the surface of the earth after the rainy season. The earth is removed to a certain depth and treated with water, which dissolves the soluble salts. The solution, being transferred to large reservoirs, where it soon evaporates by solar

heat, deposits large crystals of nitrate of potassa. This is the salt known in commerce by the name of crude nitre.

\* \* \* A considerable quantity of nitre is likewise collected in certain natural caverns. In the Island of Ceylon there are several caverns, the walls of which are covered with nitrous efflorescence. The exterior layer of the rocks is annually picked off and treated with water, which, on evaporation, affords nitrate of potassa.

Saltpetre is also obtained artificially by imitating the conditions which probably cause its production in nature. The manufacture consists in mixing nitrogenous animal matter with carbonates, generally the native carbonates of lime and magnesia, as finely divided as possible. When practicable, alkaline carbonates are added. The mixture, exposed to the air for some years, determines the formation of the nitrates, principally those of lime and potassa, which are afterward completely changed into nitrate of potassa by a suitable addition of the salts of potassa. These heaps of matter are called artificial nitre-beds.

The calcareous earth, usually mixed with vegetable mould and manure, is collected on a water-tight floor made of clay and covered by a roof. From time to time the mass is moistened with dung-water, or urine, and frequently turned. Ashes, or even spent ashes, or disintegrated rocks containing potassa, such as decomposed feldspar, are often added to the heap, which is made in various shapes in different countries. One of the best forms is that of a wall having one perpendicular side and the opposite surface sloping by terraces, on each of which is placed a little canal, intended to contain the liquid with which they are to be watered. The vertical face is exposed to the wind which usually prevails in that part of the country, or by which evaporation is rendered most active. The liquids which moisten the earthy mass seek, from capillary attraction, this surface; and as evaporation is very rapid there, the waters deposit the substances they contain in solution, and the wall is soon covered by a nitrous efflorescence. When sufficient nitrous matter has collected on the wall, a layer of several inches thickness is removed and lixivated. The insoluble residue is added to the heap and distributed over the terraces, so that the wall retains nearly the same shape. The process is repeated so long as may be deemed necessary.

Chemists are not yet agreed upon an explanation of the formation of native saltpetre. The majority admit that its formation is influ-



enced by animal matters in a state of decomposition, as in artificial nitre-beds, and the nitrogen is exclusively furnished by these matters. Others suppose that the nitrogen and the oxygen of the air may combine directly under certain circumstances, as, for instance, in the presence of porous substances and the carbonates or powerful bases; but hitherto no direct experiment has demonstrated this possibility. The latter hypothesis admits that the spontaneous decomposition of the animal matters produces carbonate of ammonia, which would dissolve in water, and there meet with oxygen and hydrogen, which water always dissolves when exposed to the air. Influenced by the carbonate of ammonia, which has a strong alkaline reaction, the oxygen and nitrogen would combine to form nitric acid, which would produce nitrate of ammonia. This nitrate reaching the carbonates of lime and magnesia, nitrates of lime and magnesia would be formed and carbonate of ammonia be regenerated, thus indefinitely producing nitrates. The double decomposition would be determined by the great volatility of carbonate of ammonia. Moreover, carbonate of ammonia might also generate nitrates in another way, by undergoing itself a slow combustion by the oxygen dissolved in the water, during which combustion its nitrogen would change into nitric acid.

On the other hand, we know that rain-water always contains traces of nitrate of ammonia, which probably results from a combination of the gases by atmospheric electricity; that is, under circumstances analogous to those of the experiment described in which we have seen nitrogen and oxygen combining under the influence of the electric spark and forming nitric acid. It is not impossible that a portion of the native nitre may be produced by this combustion. \* \* \* \*

LIEBIG'S CHEMISHE BRIEFE, PAGE 150. (Translation.)

The formation of nitric acid and the nitrates, and their presence in certain gardens, cultivated fields, in the earth, and in the walls of cattle stalls and houses, in the well-water of cities and towns, is from the same general cause as the formation of acetic acid from the alcohol of spirituous liquors. They are formed from ammonia, one of the last products of the decomposition of animal, or at least or nitrogenized substances. When ammonia, in the presence of a certain amount of moisture, chalk, magnesia, potassa, etc., (alkalies) is in contact with decaying materials its elements—hydrogen

and nitrogen—combine with the oxygen of the air and form water and nitric acid. The nitric acid then combines with the alkaline bases to form the nitrates.

The crystalline salts which are so often wept out from the walls of cattle stalls, or dwelling houses, especially in places that are often moistened from waste pipes or drains, are nitrates—generally nitrates of lime—which attract water from moisture and melt down. In this way they keep up a continued moist condition of such walls.

The greater part of the saltpetre used in France for powder-making is obtained from the under parts of the Parisian houses which are in continuous contact with the slush from the streets, and from which the nitric acid is formed. The lime in the foundations of the houses is dissolved by this nitric acid with the formation of nitrates, from which cause the walls lose their strength and crumble.

This formation of saltpetre from the material of the walls is very destructive, and has been called wall-corrosion (*Mauerfrass*). In India, where the air is moist, and of higher temperature, animal substances decay very rapidly, and it is shown that because a smaller amount of the ammonia escapes this slow burning (conversion into water and nitric acid by oxidation) a much greater amount of nitrates is formed.

FLUEGGE, PAGE 564.

“Further, in regard to certain effects of the activity of bacteria in the earth, some things have become known. Schloesing and Muentz, and, later, Warington, have shown that the formation of the nitrates from ammonia, from organic substances, is especially the work of lower organisms. Heated earth, or earth treated with disinfectants, loses the power of forming nitrates. In a similar way Wollney and Tudor were able to show that the formation of carbonic acid was likewise dependent upon the activities of the lower organisms. Further, Gayon and Dupetit, also Dénérain and Maquenne, have found proof that, in the absence of oxygen, the bacteria found in the earth have the power to reduce the nitrates with the production of ammonia and nitrogen. According to the findings of Heræus (*Zeitschr F., Hyg. Bd. 1*), many kinds of bacteria have the power (*Bacillus Prodigiosus*, *Cheese Spirillum*, *Finkler's Spirillum*, *Bacillus of Typhoid* *Bacillus Anthrax*. *Staphylococci*)

to oxidize ammonia into nitric acid. Other kinds (bacilli obtained from water, for example,) reduced the nitrates in the most decided manner. Schloesing and Muentz were of the opinion that the nitrification was due entirely to a single kind of bacterium, isolated by them from earth, but their description does not give confidence that they were dealing with a pure culture. Furthermore, Heræus' investigations necessarily brings us to the conclusion that a large number of bacteria are capable of producing nitrification, whether this is brought about through simple assimilation and oxidation, or through a kind of fermentation. There seems to be, in the earth, especially good conditions for this kind of oxidation by several kinds of bacteria, in that concentrated solutions and large amounts of organic substances certainly cause the increase of the bacteria which cause reductions. While the diluted material in the same impure earth will, after a time, give the bacteria which cause oxidation the upper hand, in the great majority of cases where we observe oxidation in earths (formation of nitrates) the organic material is spread in thin strata, so that there is an intimate admixture of air, and at the same time active condensation by surface attraction, which leads to the complete decomposition of the organic material. For explanation of the special phases, or manner, of the decomposition in earths, and of the especial parts played by various influences, we must await direct experiment with pure cultivations of the bacteria found in such earths, and the various influences exerted under different conditions."

I might add to this long list of experimentation without increasing materially our knowledge of the nature and conditions of the changes which occur in the production of nitric acid. Two points seem to be of special importance to note in the reading of these quotations. For the formation of nitric acid from ammonia, alkaline bases must be present. Otherwise it does not appear that oxidation occurs. Again, oxidation occurs only with free admission of air, and then only in the final changes in the process of decomposition. These facts seem to me to exclude nitrification as a cause of dental caries. Possibly the hypothesis might be applied to some of the very superficial spreading forms, but certainly not to any of the penetrating forms. This was my notion after studying this matter years ago, and I am still of the same opinion.

The influence of microbes in nitrification, and therefore upon the growth of vegetation, is assuming an interesting place in bacteriology.



Prof. Parr's recent investigations seem to show that plants cannot grow at all without their presence, though they may be supplied with everything else except the ready formed nitrates. The seeds will sprout and grow as long as the food material in the grain lasts, in a soil that has been sterilized and freed from nitrates, but when that store of food is exhausted the plant ceases to grow; *i. e.*, at the point where it must begin to gather its own food from the soil. This occurs when it is watered daily with solutions containing everything necessary for the most direct formation of nitrates, except the microbes. Now, if certain of the culture beds are infected with the nitrate-forming microbes, the plants in these revive within a few days and thrive, while the others die; the conditions remaining the same except the addition of the microbes. Also the drainage water from the one set of beds remains destitute of nitrates, while that from the other becomes rich in nitrates after the infection with microbes.

This sentence of Prof. Parr's seems not to be in harmony with certain natural phenomena in the production of nitrates:

"\* \* \* The conditions most favorable to nitrification are, briefly: Heat about 85 degrees, with a limit of from 55 or 60 degrees to 95 or 100 degrees, and the presence of a salifiable base as calcium or potassium. Moisture is essential, darkness seemingly; and in the soil nitrification is most abundant in the first two or three inches. \* \* \*"

Now if this observation, as to temperature, is correct, it very nearly excludes the formation of the nitrates in the human mouth.

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#### NECROSIS.\*

BY DR. G. H. McCausey, JANESVILLE, WIS.

Many of us have doubtless heard it remarked that "at the very moment that we commence to live, at that moment also do we commence to die."

In a physiological sense the saying is emphatically true, for, at the instant that the life principle is implanted in the animal organism, commences a system of waste and repair, which ends only, when through the expiration of the allotted time of life, or through complete failure of vital force, through action of various pathologi-

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\* Read before the Northern Illinois Dental Society, October, 1889.

cal processes, somatic or corporeal death intervenes, and the organism "falls like autumn leaves to enrich our mother earth."

In early life the healthy organism is continually undergoing the processes of waste and repair, the process of growth is constantly being exercised through cell reproduction of various tissues which, at the same time, serves to repair the waste caused by physiological processes.

At this time the process of reproduction is greater than that of waste, and in the normal organism generally continues until the meridian of life, after which time the waste is greater than the repair, and which finally has its sequel in the corporeal death of old age, through natural failure of the vital force. During the time in which the physiological processes are engaged in either the development or the natural death of the organism, the pathological processes may produce a complete cessation of the vital force within a circumscribed area of any of the animal tissues.

This condition is one which the pathologist terms necrosis, and which is a subject for our consideration at this time.

Necrosis is a condition which seems to be imperfectly understood by the majority of dentists, and a comprehension of its etiology, as well as its diagnosis and treatment, seems to be somewhat limited. The causes to which the presence of necrosis may be referred are various. It may generally be referred to mechanical, thermal and chemical causes, as well as arrest of the nutritive process. It may be present as the sequel of a blow, or other violence, while great extremes of heat or cold may produce the same result, while subjection of a tissue to the action of certain chemicals may produce it, while two or more agencies acting in unison may be present to cause a retrogressive disturbance of the nutritive process. In the human subject it can oftener be traced to a deficiency of blood supply, than any other one cause with which we are acquainted, and the exciting causes of which may differ.

Thrombosis may occur, in which a blood clot forms within the lumen of a vessel, and which may consist of a fibrinous concretion, or it may consist of a portion of the endocardium or membranous lining of the interior of the heart. Passing into the circulation, it may be of a size sufficient to obstruct circulation in the vessel, and thus shut off from a certain area all of the nutritive process. The result is necrosis, and is generally produced when the embolus, or

plug, becomes wedged in a vessel just before the points of its bifurcation.

The time necessary for producing the death of an area of tissue depends much upon its location, its structure, vascularity, etc., as well as the violence of the process which serves as a cause.

“The epithelial tissue of the intestinal canal and the tissues of the brain succumb much more quickly than the connective tissues, skin and bone.” (Cohnheim.)

Certain existing pathological conditions may create a disturbance of the nutritive process to produce necrosis. Syphilis may cause a thickening of the intima or inner coating of an artery, sufficiently to produce an entire obstruction of arterial circulation, causing necrosis as in embolism. Necrosis may follow eruptive fevers in children, and is generally noticed at the period of dentition, and confined to the alveolar bone may be of grave significance. Valvular disease of the heart may prove a cause of gangrene of the lower extremities, and which is but another name for necrosis of the soft tissues.

In the human organism, necrosis is oftener traceable to diminished nutritive supply from vascular changes of the inflammatory process, than from any other one cause. Those cases which are of immediate interest to the dentist are those which have their seat in the teeth and maxillary bones, and are for the most part referable to disturbance of the nutritive function from different causes.

A common cause is violence, in unskillful removal of teeth, producing fracture of the alveolar border in a manner to cut off the blood supply; and it can in general be quite easily disposed of by removal of the detached spiculæ. Other cases may be traced to impaction of the third molar; others to either periostitis or peritonitis, and others, fortunately very rarely, to continued contact with fumes of phosphorus, and is confined to those persons engaged in the manufacture of matches.

Those cases due to presence in the system of syphilitic virus are generally found located in the palatine surface of the superior maxilla.

Dental necrosis can generally be traced primarily to the presence in the tooth of a dead pulp, yet may at times be caused by the existence of a violent periostitis, involving that portion of the maxilla in which the tooth rests.



For a perfect understanding of the process by which a tooth becomes necrosed, a knowledge of the histology of the parts is of prime necessity.

A longitudinal section through a normal tooth and the jaw which imbeds it will, under a suitable microscope objective, reveal an intimate relation between the pulp and peridental membrane. As the pulp approaches the apical portion of the root, it will be found to have lost, to a certain extent, its embryonal form of tissue, and have assumed more the form of fibrous connective tissue. Tracing it through the apical foramen, we find it coalescent with that fibrous connective tissue which forms the peridental membrane, and which, after undergoing a slight modification of structure, itself coalesces with that enveloping membrane of the maxilla which we know as the periosteum. The pulp, peridental membrane and periosteum, each being highly vascular, are extremely liable to the inflammatory process.

The pulp may, from the irritation produced by thermal changes, from contact with food, from exposure consequent upon the presence of caries, from the irritating effect of the products of bacterial life and other causes, take upon itself high grades of inflammation which, unless speedily aborted, may create œdema sufficient to produce strangulation of its vessels at its apical portion, thus shutting off its only avenue of nutrition. The result is a necrosed pulp; and should the conditions be such as to favor the presence of bacteria, the putrefactive process at once commences, accompanied by evolution of sulphuretted hydrogen gas. Should the walls of the pulp chamber be intact in the ordinary sense of the term, the irritation caused by the resultant pressure of the gas upon the peridental membrane is often productive of sufficient irritation to produce in the vessels of the peridental membrane complete stasis, which in other words means necrosis of that tissue. Should a pulp alone be necrosed, it does not follow that the tooth is necrosed, for it can yet receive nutrition through the peridental membrane for its cemental portion, but should complete stasis in the vessels of the membrane occur, the result would be dental necrosis, and nature would make an effort toward elimination by a process which will be explained before the completion of the reading of this paper. Should the peridental inflammation not be of sufficient intensity to cause necrosis of the tooth, there is a possibility that it may yet extend to the periosteum, and through great violence of the pro-

cess, terminate in alveolar necrosis. In such cases, there is at once created in that portion of the vital bone immediately surrounding the periphery of the necrosed portion, that which is termed a zone of inflammation and which excites the formation of multi-nucleated cells, the functions of which are liquefaction of the surface of the necrotic portion of tissue with which they are in contact. Their action finally results in entire sequestration of the dead from the living tissue, and it remains surrounded by the purulent products of the action of the multi-nuclear cells which, through the same process, form fistulous openings through the alveolar plate. The presence of the products of necrosed tissue often serves as cause for increase in the area of retrogression, with the original necrosis as a focus. Absorption of the purulent necrotic tissue may be of sufficient amount to make serious inroads upon the health of the patient as the disease progresses, and if neglected may cause death to the patient.

In case of a necrosed tooth, nature makes an effort for its removal, and in the same process as in case of death of a portion of the maxilla, pus will be found exuding from beneath the gingivus and accompanied by a zone of inflammation in the inner surface of the alveolar cavity in which the tooth rests. This continues until the tooth may be removed by the fingers, unless in the meantime the dentist recognizes his duty and applies the forceps. When removed, the root will be found to show the same indentations as in case of the roots of implanted teeth which have proven failures.

The more immediate cause of alveolar necrosis is the presence of an inflammatory exudate between the lowest layers of the periosteum and the outer surface of the bone. In such cases the exudate presses apart the two tissues sufficiently to break their attachment, at the same time depriving the bone of its nutritive supply. The same condition may exist in any of the bones, and from various causes.

As the army surgeon is well aware, either septicæmia or pyæmia may be found associated with necrosis, and which is as much to be feared as the bullets of the enemy.

When a case of alveolar fistula presents, the dentist may expect to find necrosis of greater or less area.

In event of the inflammatory process having been of small extent, it may speedily exfoliate, but it is seldom that it does. In the latter case it may sometimes be dissolved by the application of

dilute sulphuric acid, which at the same time may serve as a stimulant for the promotion of a return of the tissues to healthy action.

Instead of necrosis, it is often the case that the dentist diagnoses that hyperplastic condition which is commonly termed a pus sac, and commences treatment by exhibition of creosote, or iodine, or perhaps both in combination. Or he may employ that active coagulant, carbolic acid, which serves to coagulate the albuminous portion of the products of the inflammatory stage, and thus furnish cause for further irritation. Failure to effect a cure brings discouragement, and all treatment is relinquished, until finally through utter neglect the tooth is lost.

Other cases involving a greater area are treated in the same manner; only to be in the end referred to the general practitioner, although a case which the dentist himself should have been competent to successfully treat.

There is an impression quite prevalent among members of the dental profession that all operations savoring of surgery except extraction, should be referred to the general surgeon.

Whether the opinion is the result of individual ignorance of the principles involved in the practice of surgery, or whether it is through fear of trespassing upon the territory already claimed by the general surgeon as his by right of preemption, the writer of this paper is not informed; but it is certain that no valid objection can be urged against the practice of oral surgery, as it is an absolute necessity if necrosis is to be successfully treated in all cases, as success involves a thorough removal of the entire mass of necrosed tissue and subsequent antiseptic treatment of the case.

In essaying the role of operator the dentist must remember that successes are never condemned, but failures always are.

Necrosis must not be confounded with caries, which is to the bones what ulceration is to the soft parts, and which may serve as the subject for another paper at some future time.

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#### THE CORRECT THEORIES AND PRACTICES OF THE DENTIST OF TO-DAY.\*

BY E. L. CLIFFORD, D. D. S., CHICAGO, ILL.

Very naturally and *a propos* of the spirit of progress, which has always characterized the Chicago Dental Society, this day has been

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\* Read at the 26th Anniversary Meeting of the Chicago Dental Society, February 4, 1890.



set apart, and is to be devoted to a reunion of dentists, for the purpose of clinics, and as the programme says, to the discussion of practical subjects. Your committee selected a theme for me, and asked that I present a paper upon "The correct theories and practices of the dentist of the present." Accompanying the invitation to read this paper, came the information that a companion paper, entitled "The fallacious theories and practices of the dentist of the present," would also be presented for your consideration and discussion, thereby confining me to but one side or branch of such a divisible question. Had I been given a choice in the selection of one of these two subjects, I think unquestionably, I should have selected the one given to my friend. It seemed to me, while reflecting upon the paper, 'twould be easier in reviewing our theories and practices to pick a flaw or find a fault with some views that I have seen presented, than to cull from the results of the prolific brains that have graced and adorned our professional horizon, the grains of wheat that have been sown with the chaff; such, however, was not my good fortune. Your committee decided for me and I have taken up the gauntlet in defense of what I believe to be as noble, as true and as grand a profession as exists to-day in the community of mankind.

The first thought that suggests itself to me in reflecting upon our correct theories and practices, is that of professional association, both local and general. When I take up my appointment book and erase from its pages a day to be devoted to such communion as we now enjoy, I feel the engagement one of the most profitable, both physically and financially, that my daily routine of business renders it my privilege to make. 'Tis not good for man to be alone. Not truer is this of the social than the professional world, and in viewing the genial faces, thirsty for knowledge, surrounding me here, I can but proudly think "I too, am a dentist." Here we meet for mutual interchange and improvement. Here we share each other's labors and experiences; here we become, indeed, and in fact, a sort of universal clinic. The wealth of wisdom of the wise and the great becomes more or less the actual possession of the humblest member of our profession. And we are second to no other class of men in the world. Our daily duties and privileges, open to us the field for the amelioration of suffering mankind, thus placing us beyond a doubt, in the van of the grand army of healers; making us instruments in the hands of kind nature to

make it possible for our fellowman to start aright in that great physiological domain of digestion, to possess, at least, a healthy organism. And some wise man long since said, "Men are at no time so like the gods, as when they try to give health to other men." Such then is the motive and such the ultimatum that prompted you and me to select this road in the pathway of life. Let us revere and appreciate the road bed ; let us garnish the way, and let us open to our younger followers such a field of aggrandizement of promotion as shall make the dentist of the future prouder, if anything, of the course he has chosen.

The year just passed has been prolific ; not in the fact that there was any fundamental discovery, nor any far-reaching theory given to the world, but the truth can be chronicled that there has been a steady advance. And this is a sufficient cause for congratulation. In science, as in finance, the advance made by leaps and bounds is often delusive, and booms in science, as in real estate, are sometimes self-destructive. "Make haste slowly," is as sound doctrine in any branch of medical science as in anything else. While no new ground has been broken, and no new theories thrown out to be fought over and proved by one-half while the other half was disproving them, the foundations of scientific superstructures already begun have been made more secure in some instances, and pulled out entirely in other cases. In either case there is a positive advance. To overthrow a wrongly conceived theory is as much an advance in science, as to make more firm the theory that really rests upon a foundation of facts, for the world is never the loser for the killing of what does not rest on fact.

That medicine is not an exact science we must appreciate, and those of us who are inclined to find fault-at this want of exactness, must remember that man, the chief factor of our exertions is a variable quantity, must remember also that man, the chief concern of the doctors, cannot be experimented upon with impunity as can the lower animals, since neither the individual nor society will tolerate this. The experiments must be performed upon the lower animals, and the effects observed in these must be applied to man as nearly as possible. But there is no single animal that is an anatomical and physiological analogue of man, and in reasoning from animals to men, some mistakes must occur as a matter of course. There is enough work cut out and in sight to keep the working scientist busy for a quarter of a century in physiology, in

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medical chemistry and in the study of germs alone ; and these are the foundation stones of all branches of medical science. There is no monopoly in this work, and no patents are granted to prevent others from making free use of the discoveries, and while work upon the foundation is necessarily devoid of remuneration, every line there sharply defined fills some portion of a gap in the building. And now in order that we may arrive at some conclusions as to our theories and practices, it will be necessary to review some of the points we have gained step by step in the past, and while it will be impossible within the scope of time allotted me to criticise and dwell upon the pros and cons of the several steps, I rest upon the assurance that you appreciate the fact that it is only my duty to-day to attempt one side of our question.

The history of the world, Goethe says, is the forum of the world. It alone presents to us a portrayal of truth and guards us against error, and to study for a while the history of dentistry, or to recapitulate had we the time the good points that have been gained in our onward march would I know interest you as it has me.

In no direction has it afforded more substantial grounds for positive opinion than in therapeutics. To the restless scientific mind, ever alert for new discoveries, a knowledge of previous achievements in his time is essential to a proper estimate of any subject he wishes to logically and scientifically discuss, and we have certainly sufficient evidence in the literature of the past that a master mind may group facts and make deductions which may stand the test of time. By proceeding in such a course our hope would be, that although working in a time of great confusion, the genius of our time will be able to bring order out of chaos in every branch of medicine, and to endow with a scientific dignity the knowledge of the future.

History has repeated itself here as in other departments. The opinions of the most judicious, philosophical and successful dentists of past ages, have been sustained by the judgment of the most enlightened era. Taking for our demonstration the average patient that presents himself to-day to be a beneficiary of whatever science or skill we have attained, the first theory that presents itself, and one which has stood the test of time and can but stand all future tests, is dental hygiene, or a thorough demand and appreciation of oral cleanliness. No operation of the present dentist will bear such fruitful recompense, and no professional effort in his



past will go further to establish the confidence and respect for the operator in the mind of the patient than the initiatory effort to first establish a possibility of a return to normal physiological function, by removing and neutralizing whatever may exist as a pathological irritant. Should salivary or serumal deposits exist, should discoloration and unsightly effects be present, should roots of abandoned teeth still remain in the alveolus, I believe it to be a correct theory that these should first attract the attention and demand the services of the operator, to be followed by a respite from professional taxation until nature, by the intelligent prescription of the operator, and with the assistance of a proper tooth powder and mouth wash restore the remaining tissue and surroundings to a healthy condition. By so doing the dentist is relieved, in a great measure, from one of the most disagreeable parts of his operation, that of working over a filthy mouth, the patient is relieved almost in toto of that extreme hypersensitiveness of the tissue operated upon, and also the danger of possible infection by carrying some of the poisons known to exist in these conditions, either to parts of the organism already healthy, or the operator conveying the same to other patients not already infected by means of his person or his instruments. Put in the required amount of time to accomplish this condition, and let it be one of your first correct practices to make an adequate charge for the same.

As to cavities of decay. I will not tax your patience by spending time to dwell upon ordinary cavities, or the substance with which they should be filled. I take it for granted that we all acknowledge that the ideal filling has not yet been found, but that, in the light of our present knowledge, the fact is established that, so far as simple cavities at least are concerned, the creed of "In so far as teeth need filling, in a vast majority of cases gold is the best material to be used" still commands our respect.

The theory of dental incompatibility or antagonism I believe to be correct in certain cases, as experience has shown that under certain conditions almost all single substances are contra-indicated. In patients of certain temperaments, in teeth where decay has progressed so far as to endanger the vitality of what remains, and in that class of patients in whom the strumous diathesis so greatly predominates, I believe precaution to be the better part of valor. In this class extreme solidity and density is not a concomitant feature of the osseous structures, and a change in the foundation texture

becomes an absolute necessity. We have learned from past experiences, and it has become one of our correct theories, that the dentine of a human tooth in its normal state is a living structure; that, as man, the principal factor in our daily efforts, is a variable factor, so, also, is that part of his anatomy which is now attracting our attention variable, and judgment will be required of the operator who presumes to thwart the onward march of disease. I say disease, because I am convinced that one of the correct theories that must form a part of established practice, is that a decayed tooth is a diseased tooth, and our effort of filling that tooth only a process of curing that disease. As inflammation is a concomitant of all surgical pathology in the soft tissues, so is it also an accompaniment in the osseous, only that when applied to these structures a new name is forced upon our too-willing ears, and when applied to dentine is known as eburnitis.

Now, the pathologist of the present is daily being convinced, and fast coming to the conclusion, that inflammation in any of its forms is not necessarily pathological, but only nature's effort to again restore the tissue attacked to the nominal status, or to protect it from external irritation. So, in these frail and porous dental tissues, it becomes necessary to call to our assistance this condition of eburnitis by irritating the fibrillæ to action, and causing a protecting deposit.

Thus our theory is correct in using such substances as oxychloride of zinc and oxyphosphosphate of zinc as a lining to such cavities, or as a temporary filling, to be worn until nature has restored the parts to such a condition as will stand the harsher contact of a more permanent substance; and following up our line of thought on dental therapeutics will we be brought to note the differences in the therapeutical action of our list of filling materials. Some we know to act entirely by their mechanical presence, and by the dexterity and skill with which they have been manipulated, while others undergo change, and produce, *in situ*, medicaments well calculated to assist the operator in his efforts; so the ingenuity of our profession has thrown upon our markets amalgams, and as each of these combinations has been found to possess some quality rendering them applicable to certain cases, so each has been found deficient in some other attribute, forcing the dentist to further search for the ideal filling. In regard to gold as a filling material, and our theories and practices respecting its physical condition, that is to say wheth-

er cohesive or soft, so called, a mere reference at this stage of our professional progress I feel will be all sufficient. I believe it to be a correct theory that all simple cavities should be filled with soft gold; that all cavities extending to and encroaching upon the gingival margins should be started at least with soft gold, and that all cavities having sufficient depth to be retaining in character should be partially filled with soft gold, contours, of course, and masticating surfaces being finished with cohesive foil, and sufficiently condensed to withstand attrition; and as to the external outline or form of approximal and crown fillings, nature has given us a pattern in the shape of the organ operated upon that I believe we cannot improve; and another correct theory, which forces itself upon me at this stage, is that all cavities which have required no other treatment should be wiped out with a slightly escharotic antiseptic, and afterward thoroughly dried prior to filling. For this purpose I am greatly pleased with a combination of creosote C. P., oil of cloves, oil of cassia, and vol. ex. of eucalyptus. This brings us to a consideration of some of the medicaments used by the dentist. First, none but the best, and those having a known and permanent chemical formula, should ever find a place in our medical armamentarium. 'Tis true the dentist, from the nature of the conditions he is called upon to treat, and also from the surroundings of those conditions, necessarily must use strong medicines, some having a powerful action, as well as an almost unbearable odor.

In regard to overcoming the last of these attributes, it is my practice to keep all of my medicines in one close and dark case. In that case I keep a very small cup containing finely pulverized recently-parched coffee, to be removed every two weeks. As a deodorizer it is effectual. I also put a small quantity into such medicines as are especially odorous. It does no harm, in fact it is possible it may do some good, as recent investigators are now ascribing to it a slightly antiseptic property.

Referring again to the best of articles, allow me to enumerate a few: First, creosote. I believe from what I read, that it is the practice of many dentists to repair to the nearest druggist and accept whatever he hands out to them. If such is the case no wonder we read reports of failures by confrères in their efforts to profit by the experience of some more careful practitioner by copying his prescriptions and his methods. It is a lamentable fact that too many of our American products are unstable and uncertain,



and the practitioner of the present or the future who will court success must see to it that his agencies are correct. For the Dental office, I know of no use for ordinary commercial creosote. It is of uncertain and unstable composition, and almost entirely devoid of those elements so necessary to success; none but creosote C. P., from pure beech wood tar, should be prescribed or used.

We will now look up Eucalyptol: Most of the remarks above can be truthfully applied to this agent, and, in addition, a dirty, gummy and almost filthy condition of its receptacle renders it exceedingly objectionable to the neat operator. Those of you who have failed with this agent, or become disgusted with its tendencies, if you will employ in the future the Australian product of Messrs. Sanders & Son, and that only, you will be pleased with the results. In regard to this agent also, even Dr. Black is compelled to acknowledge that it possesses a power of inhibition to microbic life that he is unable so far to account for. Suffice to say, experience is the best proof, and it does the work admirably.

One article more I would be glad to dwell on for a moment, inasmuch as the authority quoted above, as well as most investigators of recent date has questioned its inhibitory power, that is our much-abused, scarcely tolerated, malodorous iodoform. As to the abstract fact that micro-organisms flourish and thrive in a medium impregnated with this agent, I suppose at this time we must not doubt. But also as to the abstract fact that those pathological conditions, so much to be dreaded by the modern surgeon, do gradually but surely disappear when met by this enemy, we also cannot question. Why is this; for in order to be scientific we must have a reason from cause to effect. Is it not possible that in our diversified agents of therapeutic value we possess what might be termed either *direct* or *indirect* powers? Is it necessary in order to prove that certain agents possess antiseptic powers to show that they must invariably destroy the bacteria by contact or is it not probable in the light of our present knowledge that such a change of surroundings may be brought about as to destroy some one element in the media necessary for the propagation and nourishment of those pests of the present day? We do know as one correct theory obtained that certain conditions are necessary for the sustenance of microbic life. Mycologists do not differ upon the fact that *moisture* and a certain temperature must be maintained. Now if we can destroy or alter either one of these conditions materially,

may we not hope, and can we not thereby account for the beneficial effects of some of our agents hitherto not understood. So it is, I believe, with iodoform; while the experimental studies made by German, Danish and French observers during the years of 1887 and 1888, went far to prove that iodoform was not a germicide. The recent researches of Jeffries, of Boston, and later those of Kunze, go to show that the agent possessed greater powers than was thought by Heyn and Rossing. And among other conclusions reached by Jeffries was the fact that iodoform possesses decided power to stop serous oozing, and therefore could be employed where moisture threatened the integrity of an antiseptic dressing. Upon this hypothesis the medicament has received especial attention of late by our medical friends in their war upon the tubercle bacillus, and I am told with most gratifying results. Such being the case, I am satisfied the results of our practice will justify as a correct theory the continued use of the agent.

Another theory which I believe to be correct in carrying out the idea of perfect dryness in pulpless teeth, is that of the application of heat. My reason for this theory, I have so often set forth in other papers, that I refrain at this time for fear of being tiresome. In fact, I fear I already have taxed your patience too long. I know you must have concluded before I began that 'twould be an impossibility to cover the field in one paper, and I must ask your indulgence for merely mentioning, almost without criticism, many points in our theories and practices which have doubtlessly occurred to your minds and have also crowded upon my pen.

In the field of orthodontia, I must content myself with the assertion that it is our duty to save all possible, still, also, not to hesitate to sacrifice the life or the existence of the one for the benefit of the many.

As to the causes of congenital defectiveness and deformity of the teeth—no doubt that heredity and nutrition play their part—I believe that the proper dieting of mothers and children, with an eye, of course, to their hygienic surroundings, will go far to lessen this affliction upon the human family.

As to reflex neuroses, we cannot turn a deaf ear or a blind eye. I regret, however, that the term "reflex," as applied to certain pathological conditions, has been so often misnamed and such erroneous conceptions have been found under this all-embracing title, scarcely a portion of the body or organ has escaped by the recent

literature from the pens of those who devote special attention to the diseases of a single organ, is filled with cases illustrating the potency and power of the particular organ which they treat, to cause reflex, nervous disorders. The ophthalmologist, the rhinologist, the chiropodist, and last but not least, the dentist have surveyed this field; the general surgeon not forgetting to account for many of the phenomena brought to his notice by the conditions present, necessitating the operation of circumcision and castration. I would like to dwell for awhile, did time permit, upon our theories in regard to the etiology of caries; suffice to say I believe it correct, that fermentation, putrefaction and microbes hold the fort, and those of you who have read the article of Dr. Ernest Laplace in the January number of the *International Dental Journal*, will have a hard nut to crack if you believe otherwise.

Dr. Miller, I believe, has settled this question. The condition usually termed pyorrhœa alveolaris should also attract our attention. I am convinced more and more every day that 'tis a constitutional deflection, aggravated by local irritants, and that our treatment should be accordingly. Stomatitis and apthæ fall in the same category, and, of course, are to be met likewise. The field of prosthetic dentistry is a large one, and, of course, should have a great deal of thought—too much to be attempted at this time. The theory of non-conducting and consequent hyperæmia of the tissues under non-metallic plates I am glad to say is gaining ground, and I believe to be correct. Where the finances of the patient will allow, a revolution in our practice in this department is absolutely required. Crown and bridge work no doubt has a place in dentistry of the present. Whether such will be the case in the dentistry of the future, I must refer you to my friend Dr. Crouse.

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THE FALLACIOUS THEORIES AND PRACTICES OF THE DENTIST  
OF TO-DAY.\*

BY J. W. WASSALL, M. D., D. D. S., CHICAGO.

The title very naturally divides my subject into two parts: Fallacies of Theory being Part I. Fallacies of Practice being Part II.

For the purposes of this paper I shall take fallacies in theory or practice to mean—the misleading or mistaken theories, and

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\* Read at the Twenty-sixth Anniversary Meeting of the Chicago Dental Society, February 4, 1890.



wrong practices or methods, prevalent in the dental profession to-day.

It must be borne in mind that the criticisms herein contained will to a large extent be colored by the prejudices of the writer ; also that he with you would have preferred hearing judgment pronounced upon the modern procedures and principles of dental practice, by a man of larger experience and wider observation.

Under Part I, or Fallacious Theories, without attempting to include all of the more prevalent follies, we shall consider four topics:

1. *Dental Education.*
2. *Dental Legislation.*
3. *The Status of Dentistry.*
4. *The Causes of Dental Caries.*

1. *Dental Education*: Owing to legislative enactments in most of the States which practically require a degree in dentistry of all who would enter upon its practice, the colleges are put in the position of keepers of the doorway of the profession. Like St. Peter, it is the function of the Faculties to stand at the gate and decide who shall, or who shall not enter in. Is it not fallacious, then, in the conduct of these institutions to accept as students, youths who are partially or totally unfitted by reason of lack of early education and training, to become a credit to the dental profession.

It is fallacious to suppose that as high an average of excellence can be obtained from boys who are but imperfectly schooled in the common branches, as from those who have had the advantages of early training in methods of study. All honor to the few exceptions who by persevering toil and patience have triumphed over the twin evils of ignorance and poverty. There are such courageous spirits occupying the highest positions in every profession; but it is a fallacy for the Faculties not to check the present tendency to over-crowd the profession, by discriminating against the undesirable recruits.

It is fallacious not to admit that the profession will more rapidly grow to greater usefulness by choosing recruits from the more enlightened and educated classes of society. The time has arrived when a true professional spirit should possess us, and it were best if even a previous academical or university training could be insisted upon, as is at present the case in European countries with regard to the profession of medicine. A proper discrimination in accepting matriculates or office students will protect the profession

against much discredit and quackery, and at the same time do a genuine service to those who would succeed better in other vocations.

It is likewise a mistake for colleges to encourage mature men, who have failed in business or other professions, to enter dentistry. These bankrupts are usually attracted by the belief that their fortunes will be resuscitated, instead of being impelled by the spirit which should actuate true professional men.

Another fallacy, the results of which are quite apparent at times, is the disposition to multiply dental colleges, rather than to unite all efforts in improving those already in existence.

2. *Dental Legislation*: Under the present lax laws which permit the incorporation and management of colleges with powers to confer degrees by irresponsible men, it is fallacious and against the best interests of the public, to allow graduates of colleges holding diplomas, to be licensed to enter practice without a new examination.

As long as the present disgraceful state of affairs exists, graduates of all colleges should, for the better protection of the public, be examined as to fitness to practice, by a board of examiners who have no connection with any dental college.

3. *The status of dentistry*: Toward the close of the last century, dentistry, which had up to that time been practiced in a very primitive way by the barber-surgeon and village blacksmith, began to assume importance. The famous John Hunter, in his well-known work, entitled "The Natural History of the Human Teeth," published in London in 1771, was the means of attracting attention to dentistry and establishing it upon a scientific basis. Other medical men were thereby led to devote themselves to this branch of medicine, and the study of the early history of dentistry in this country, shows that honorable dental practice and medical practice were at that time practically one. The attempt in America, however, at this time to found lectureships on dental subjects in medical colleges, was met with a rebuff on the part of medical men. Owing to that cause and to the fact of the largely mechanical nature of the dentist's work, his vocation has grown up as a profession separate from medicine, and I believe it to be a fallacy not to acknowledge this separateness as well as the wisdom of it at the present day. But notwithstanding this separateness it is undeni-

ably true that the practice of dentistry is the practice of a branch of the great healing art.

To state it less broadly, a dentist is a medical man to the extent that he understands and is able to scientifically treat diseased oral tissues. This, however, does not make him a member of the medical profession. He is a true follower of Æsculapius, practicing a branch of the healing art, called the "profession of dentistry," but it is apart from the organized "medical profession." Therefore the desire occasionally manifested on the part of a few American and the majority of foreign dentists, to be amalgamated with the medical profession, is a fallacy.

No new arguments are needed to prove the undesirableness of such a union. It would be fraught with danger to the public, because it would admit to dental practice a throng of physicians unskilled in dental operations. It would bring misfortune to medical men in admitting to equal privileges a horde of incompetents, and it would be a calamity to the dental profession, the details of which I need not picture.

Again, we constantly speak of the "dental profession."

The question may be asked, without impropriety, are we a profession? If we refer to the men who are gathered here to-day, and the regular members of the dental societies, the answer may be, "Yes." If, however, we refer to the rank and file of dentists as they are found throughout the land, the answer must be an unqualified negative. Dentists as a class are not professional men in the accepted sense of the term. The mass have not yet risen to that degree of culture qualifying them to rank with members of the learned professions. This state of affairs is not, however, without hope. The rapid advancement of the past forty years prophesies a realization of the most optimistic hopes. If the signs of the times signify aught the vocation of the dentist will in due time attain to a position of unquestioned dignity and respectability. How soon this shall come to pass depends upon the ideal we set before us and the earnestness and zeal with which we work toward it.

4. *The causes of dental caries*: It is not uncommon with certain men in referring to the well-established fact that micro-organisms are the cause of dental caries, for the would-be facetious speaker, or writer, to call it the "bug theory."

Nothing could be more misleading or unscientific than such cheap wit, or more plainly reveal ignorance of the subject.



It has been conclusively demonstrated by Underwood, Miller and Black that a low order of vegetable life—a micro-organism known as the *streptococcus media* is the chief cause of dental caries. The life processes of these micro-organisms, consist in taking up starch or sugar, and converting it into lactic acid. This lactic acid dissolves out the lime salts of tooth structure, true caries of the tooth being the result.

## PART II.

Under this heading the following fallacies will be briefly discussed :

1. *Imperfect root canal fillings.*
2. *The misuse of the matrix.*
3. *Copper amalgam.*
4. *Implantation.*
5. *Inadequate instruction to patients in the care of their teeth.*
6. *Bridge-work.*
7. *Crowns without bands.*
8. *Capping exposed pulps.*

1. *Imperfect root-canal fillings* : According to the observation of both dental and medical men, prominent among the latter being Dr. Samuel Sexton, of New York, much intense suffering, and positive damage result from this operation.

Properly managed, pulpless teeth yield results the most reliable and permanently useful of all the operations in the realm of dentistry. But what are the facts—that as a rule the operation of root-canal filling is unskillfully or dishonestly performed !

In my opinion Dr. Sexton's arraignment of the dental profession is not unjust. From his point of view, as set forth in his articles on the "retention of dead teeth in the jaws," his condemnation of the procedure is justified. Not one of you present but is constantly called upon to relieve agonized suffering from alveolar abscesses, arising from imperfect root filling. Such teeth, upon being opened up, will disclose any of the following conditions: Root canals partially filled; root canals filled with improper material; or, if there be more than one root, one or two canals *unfilled*.

There are several causes for this state of affairs which it is scarcely necessary for me to enumerate. Two, only, of the most obvious will be alluded to. It is fair to presume that some are ignorant of the consequences which follow imperfect operations in root

canals. Others knowingly take the chances, and high authorities are not wanting which justify them in such a course. The other prominent cause is in the inadequacy of fees charged for such services which conduces to slovenly haste and an easy conscience.

2. *The misuse of the matrix*: There can be no doubt that the use of the matrix for gold fillings, by the inexperienced or not over careful operator, is productive of very many defective fillings. In the hands of those who are scrupulously careful and peculiarly skillful in its use, the matrix may be a great aid in economizing time and labor, as well as a boon to the patient.

By its assistance in such hands, complex operations are simplified as if by magic, and therein lies the danger, for even the most conservative among you may fall a victim to its allurements. The evils resulting from it are two-fold:

1st. The failure to make a perfect adaptation of filling material at the angle of the margin of the cavity and the matrix.

2d. Injury to the margin of the cavity produced by too much pressure of the matrix against it.

Its use by students in colleges should be prohibited.

3. *Copper amalgam*: The use of copper amalgam is only indicated to check recurring caries on the buccal surfaces of second and third molars. To the extent that is used to take the place of ordinary amalgam filling beyond that, it is a fallacious practice. I am informed that this material is used by many gentlemen in this way. An authentic statement comes from one of our large cities, of a gentleman in a highly reputable practice, having used 120 ounces in two months.

4. *Implantation* is a fallacy, because the operation has no scientific basis upon which to rest. Although many of these operations have been made under the most favorable conditions, most of which up to the present time seem to be successful, yet the grave risks of inoculating healthy persons with disease, stamp it an unjustifiable procedure. When performed under the most favoring conditions, it can hardly be considered as promising in its results as the old operations of replantation, or transplantation, and careful records of such cases show that they have a limited period of usefulness only.

5. *Inadequate instruction to patients in the care of their teeth*: A fallacy more harmful than all others is for the dentist to imagine that his whole duty to the public health is performed, unless he has taught his patients proper personal care of the teeth. The

dentist's responsibility is not ended until he has taught—in many lessons it may be—that the observance of proper hygienic measures will almost entirely prevent tooth destruction, and that filled teeth, as a rule, are more liable to suffer from caries than they were before the primary lesion occurred; that it is imperative that the teeth be examined by a competent dentist, after a longer or shorter interval of time as the case may be. This is a duty he owes no less to the public than to his profession, or rather to the upholding of the reputation of filling operations, the durability of which is so often impaired by reason of the dentist's neglect to impress his patient with the importance of cleanliness and regular examinations.

6. *Bridge-work*: It is a fallacy to condemn bridge-work in toto. Quacks have taken it up, and by them as by perhaps many reputable dentists, ill-advised and faulty bridges are applied, to the injury of good teeth and the discomfort of the wearer.

It is a fallacy for the profession to refuse to see the great advantages of dentures of this kind in cases well adapted for it which of course are limited in number. Bridge-work is a positive good, and has come to stay. It is for the best men to withhold their study of the method no longer.

7. *Crowns Without Bands*: It is a mistake to crown a root by any method which does not employ a band or ferrule. The fallacy of mounting such crowns is shown in the split root, which sooner or later results.

8. *Capping Exposed Pulps*: Alveolar abscesses resulting from the death of pulps caused by capping, divides with imperfect root-canal filling, the distinction of being the cause of the greatest amount of suffering directly resulting from dental operations. To decide when to cap and when not to cap an exposed pulp, baffles the judgment of the most skillful diagnostician. A desire to preserve a living pulp on one hand, and on the other hand a disinclination to create a possible cause for an abscess, though it may not occur until months or years after, puts the dentist in a perplexing position. However it may be set down as a safe rule, that the chances of an abscess should be taken in all cases where the person has not reached an age at which the tooth is thoroughly calcified. But the wisest judgment, apparently, will often lead to disaster, owing to the insusceptibility to treatment and insidious behavior of diseased pulps. The fallacy lies in the delusion that one can be successful with this operation in even twenty-five per cent of the cases treated.



## PRESIDENT'S ADDRESS—SOUTHERN MINNESOTA DENTAL SOCIETY.

BY DR. H. L. CRUTTENDEN, NORTHFIELD, MINN.

The dental organs are given us for the purpose of dividing and grinding our food, mixing it with the secretions of the mouth, properly fitting it for digestion, absorption and assimilation, whereby every member of our body is supplied with new blood and life, so that they can properly perform their several functions. Care should be taken of the teeth and surrounding parts, that they perform their important aid in the great system of human economy. That should be our duty.

If the right food be taken and a proper mastication, digestion and assimilation takes place, then we have health, which is above wealth, and necessary for happiness.

Not unlike the dental organs are our dental organizations. Our local, State and National societies. The food of thought is given in the form of papers and clinics ; it is divided, ground and mixed with the ideas and opinions of others, thereby fitting it for the practical application of every attentive member ; aiding us in a more proper manner to perform the varied operations we are called upon to do. There is certainly a great variety of food to feed this professional body upon, so that every member may have the proper share to keep new blood and life in us, so that we can skillfully do our duty in the line of work which we have chosen. To supply this food and aid in its digestion or absorption, should be the duty of our dental societies.

If the right food be taken and it is properly treated we will have health in the profession and harmony in our societies, which are essential for good works.

Let us consider some of the varieties of food we have : The rubber plate or common bread, is indeed the food of the "rank and file," the rich and poor alike partake of it—the great necessity that we must have. Bread will always be a common article of food. Artificial teeth, in spite of our skilled operators, will ever be as long as there are mouths. They are so common, so simple and easy to make, and yet how seldom we find them good ; how often are they *dark* (between the joints), *heavy* and *stale*.

Good bread is a blessing from God and the baker,  
A good rubber plate is alone from the maker.

The pastry cook and the skilled operator often consider it a disgrace to have to make bread and rubber plates. How often are they left for the baker, and "Cheap Johns," or the "plate factories."

Why is it some of our most expensive operators inflict upon their confiding patients artificial teeth that are an outrage upon them, and a disgrace to the dental profession?

The baker kneads his bread, and we need better rubber plates. Any dental society should regard it as time well spent in considering and trying to improve this article of food.

Gold, continuous gum and other plates are good, even better in many respects than rubber, but they are like fine rolls—not as common, they cost more, and do not meet the wants of the people.

Plastic fillings, or beefsteak, are common, and within the reach of all; some are good and some are tough. Time will also be well spent in trying to make them better.

Gold fillings are like the finer cuts, and choicer meats; they are superior, and we have them in many forms, according to our need and taste.

Gold crowns are like the school boys definition for salt, "that which spoils my potato when there is none on it."

Salt and crowns both have saving qualities that are rarely equaled; crowns are a reward of *demerit* rather than of merit, for through the negligence of the patient or the unsuccessful attempts of the dentist to arrest the ravages of decay, the old roots can still be saved and wear crowns that may be the envy of many an old Amalgam Plug.

Bacteria is simply hash; it is to the Dental Society what the latter is to the boarding house; there is a mystery about both. There has been such diversity of opinion as to the kingdom they belong, the animal or vegetable, I would say that they are a mixture of both.

Dental patients and cheese are alike, they are good for those that like them, but sometimes they are very *binding*. When we recall the over-dose given us by the Goodyear Dental Rubber Co., we can well dread to take any more from the International Tooth Crown Co. When we look back over the past, and see what dentistry was fifty years ago, see what instruments, preparations and systems have been introduced for our use, coming as they have through the portals of National Capital, we cannot say that they have done us harm.

When it was honorable for a dentist to protect his invention, the profession and himself, by obtaining that protection from the Government in the form of a patent, our profession has never taken a backward step in the grand march to the high place dentistry now stands. Does the "Professional Atmosphere and Morals of a Liberal Profession" now stand in danger? If so, shall we cast out all "patents and secrets?" If we have crossed a swollen stream safely upon a horse, shall we say to the beast, "You are only a common working brute, it will be a disgrace to be with you longer; go your way, we have no more use for you."

Dr. Meriam, in his able paper before the New York Odontological Society, has brought it before the profession in a very emphatic manner as it comes from such a man, a genius who has a head filled with practical ideas, and a heart larger than his head.

His aim is to elevate the profession by making it a disgrace for a dentist to hold a patent or secret of his invention. I indorse some of his ideas, and will not be presumptuous enough to say but he may be right in all; yet I now believe we should have dental patents for protection alone, but never to put a fellow practitioner under tribute, or sell them to grasping monopolies. For protection I mean to prevent another party taking the invention or suggestion, obtain a patent, as has often been done, then compel the true inventor to pay for using his own invention.

Also to protect the article in its manufacture, that it be properly made, so as it will not be detrimental to the success of the article. And to protect the inventor; if he uses his brain and skill to perfect something that will be of use in the profession, why should we begrudge him remuneration, or at least honor, for producing it, not stigmatize him, and say "he disgraces the profession and has no right to the title of Doctor."

If we give it to the profession by announcing it in the journals, before many months some party will come forward and claim it is not new; he had done the same thing before. Why do members of other liberal professions protect themselves? Why do authors copyright their works? A copyright is simply a patent for books and works of art. It gives the author an exclusive right to his works for forty-two years, while a patent is for seventeen years. Who questions the right to copyright the works of such men as Dr. Gross, Agassiz, Huxley, Darwin, and others? Is the "profes-



sional atmosphere" disturbed by them? Why do they protect themselves? In short, why do we have locks on our doors?

If we wish to belong to a liberal profession, why not secure the patent, and be liberal by giving it to the profession?

Dental education is a tonic, but, unlike cheese, it does not harm if taken in large doses; upon the bottle should be inscribed, "shake well before taking." If we give some of the students the "shake" before they enter our colleges, it would be better for them and the profession. We find the directions to read something like this: "Take during five months of each year for two or three years." Why not add, "and longer if required?"

Within the past few months most important advances have been made regarding dental education in this country. The National Board of Dental Faculties have seen fit to add another year to the course of instruction in the near future. This is a move in the right direction, but it does not go far enough.

We are not all constituted alike. It takes longer for one to master a certain branch or department than it may another. It is time, not qualification, that governs the curriculum of our dental colleges in the "Requirements for Graduation." This stereotyped provision is always first: "Attendance upon two or three courses of lectures," etc. When our dental colleges contract to give a degree for the consideration (of the proposed minimum fee to be fixed at \$100.00 a year) for three years, answer a certain per cent of questions, and leave a set of teeth for the wind to blow through; does that mean entirely higher education or dollars to the institution?

How would it be to have, first, the student will be entitled to a degree when he is qualified to practice dentistry in all its branches. Let the college not be so crowded, but every Professor shall know, by personal observation and examination, when he is qualified; if a time is fixed, let it be two years, and longer if required. I do not wish to be understood that I do not recommend a three years' course; far from it; let it be seven, if necessary.

As we are striving to be classed with the liberal professions, why should not we be governed by the same laws and requirements that are found in many of their institutions? When a student enters a literary college or university, he is examined, and enters the class he is fitted for. It makes no difference to the institution where or how he has obtained the knowledge, in the seclusion of his chamber or the halls of the college; if he is qualified

to enter the freshman or senior class, he takes the place where he belongs according to the knowledge he possesses.

There are hundreds of non-graduates who are desirous of taking instruction necessary for a degree; men who have spent years in practice and study, that are qualified to practice, yet they have to take a place in the class with the boy who should still be in the common schools. Who perhaps does not know (unless he has been in a dental chair), but what we melt the gold and pour it in the teeth in filling them. You place them side by side with ten or fifteen months' instruction, give them both a degree, and in the light of the so-called higher education they are equal. There is an injustice done both. The practitioner does not advance because he does not see the need of spending time and money to obtain that which he already has, and an injustice is often done to the young student in turning him out before he is qualified, inflicting him with the "big-head" and possibly his patients with something worse.

There is another article of food that is partaken of too often in the dental societies. Some call it "cabbage," others "cheek," others "free advertising." I will not name it, but say it is intentionally letting your name appear upon the programme of the society for a paper or clinic, without attempting to give anything--not even an excuse.

Gentlemen, I have given you a number of articles of food to chew, and a tonic to wash them down. I think you have had enough; I will give you the pie later. I am aware that some of the food will not please you. If it is not to your taste, spit it out; that which is good, swallow. If you have swallowed anything that does not digest or set well, take something for it. I have prepared them all very plain, with very little flavor or dressing; some may be "too fresh," or too hot; there is none that is very sweet.

My only aim has been to build up, strengthen and sustain this professional body of ours--this body with its members, each having their own mission to perform, that they may work in harmony. "The eye cannot say unto the hand I have no need of thee, or again the head to the feet, I have no need of you." We should work together, each give and in turn receive. Inform others of your failures, not always the successful cases, so that they may keep clear of the rocks.

Now I will give you the pie I promised. It is simply words of praise, encouragement and thanks, to the members of the Southern

Minnesota Dental Society. Your organization is one I am proud and glad to belong to; you are deserving of praise for organizing and keeping up a society of this kind, isolated as you are from one another. It takes more time, trouble and expense to attend the meetings of the society than for those located in the cities.

Not being close together, your committees cannot meet at a moment's notice; each must communicate to others by letter in arranging the programme and transacting business; and your active members being few, the burden rests heavily upon those who do their part to make the meetings of interest. You have done nobly in the past, all you can do is to keep on and others will come forward and help you.

Let each one on your return home, begin to prepare something for the next meeting. Select some subject and start to arrange your thoughts for a paper, do not wait to be asked by the committee, or wait until a few weeks before the meeting before you begin. Put down in writing the important points of some case in your practice; take up some line of work, and if successful, report it, and if not, do the same, and perhaps through the aid or advice of others, you may be started in the right track.

Above all, do not fail to attend the meetings, and let that mean from the beginning to the end. You and your patients are the ones that will gain by it; you cannot afford to miss a meeting when you can receive or impart some benefit; by so doing you will have successful meetings.

Gentlemen, I thank you most heartily for what you have done for me in the past, the present honor is among the least.

I wish to thank the members of the profession from the "Twin Cities" for taking so kind an interest in us, and who have always been so willing to help us in making our meetings of interest.

You are now to enter upon the work of the Seventh Semi-Annual session of this society. In the programme you will find a bountiful and varied "bill of fare" has been prepared; I hope you will find things that will be better to your taste than this feeble attempt of mine; I trust that you will get something that will do you good. Let us treat each article that has been prepared as we should our dinner; and above all, when the hour arrives, let us be on hand to our meals.



## PROCEEDINGS OF SOCIETIES.

## CHICAGO DENTAL SOCIETY.

Regular monthly meeting, January 7, 1890, Dr. P. J. Kester, President, in the chair.

DR. E. A. ROYCE read a paper on PUTREFACTION,\* which was followed by one on PUS,† by DR. P. J. KESTER.

On motion, the two papers were discussed jointly.

DR. LOUIS OTTOFY, in opening the discussion, said: I think the essayist has reviewed carefully the subject of putrefaction, and has given us the latest theories in regard to it. It is a question in my mind whether the word putrefaction is at all necessary to designate the process which we understand by it. Putrefaction, as I take it, is merely one branch of the general subject of fermentation. The reason why we designate the process as one of putrefaction, is that certain gases are evolved which are appreciated by us as "unpleasant" and these have been named "putrefactive." It is possible that these gases may be evolved by the processes of fermentation in such a small quantity, that they unite with other gases that are produced by the decomposition of water or air, so that virtually putrefaction may be going on and yet we do not recognize it as putrefaction.

The process itself is of course a very difficult one to understand, and it seems to me that those who are doubtful as to the truth of the germ theory, might learn a good deal by a study of the process of fermentation. It is beyond question that fermentative processes are carried on by microbes, and the experiments which the essayist has cited clearly prove, that fermentation cannot go on without the presence of that something which is present in the air, and which we designate as a microbe.

How the process is accomplished is a question that is not well understood so far as I can learn. Probably the process is brought about in this way: We understand that the atoms of organic compounds have a tendency to separate and return to their original state of independent elements. Some force, termed vital force, holds them together. When this vital force is withdrawn, microbes

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\* See page 25, January, 1890, DENTAL REVIEW.

† See page 31, January, 1890, DENTAL REVIEW.

enter, and the different atoms composing organic substances may separate. The microbe or ferment, whatever it may be, is what initiates the process of separation. The experiments which have been carefully made, where it was shown that when air has been absolutely excluded, fermentation does not occur, are satisfactory and are sufficient to prove that it is the substance in the air which initiates the process of putrefaction or fermentation.

This question of course is important to the dentist. There have been no less than eighteen different kinds of germs found which may be present in the mouth; and if you remember how readily and quickly inoculation can be produced by dirty instruments or carelessness, you will understand that a process of fermentation may be set up in remote parts, as for instance, in the peridental membrane.

DR. E. L. CLIFFORD: I am very glad to note the position the essayist has taken in regard to the subject of pus. The study of pathological researches is an important one. It would not be expected that we would come into a society like this and be able to detail anything that we had found out ourselves. We must have recourse to the literature of the day, and if we can bring before you different theories that have been found out by those who have studied this subject, it is as much as we can hope to do.

I am informed that in some countries the governments place certain funds at the disposal of original investigators, and that these men throw off the cares of business and devote their whole attention to the furtherance of general or special information. Our government, up to this time, has not seen fit to do so much for us, consequently we can only depend upon individual efforts, and upon the private pocket-books of those who wish to advance our interests and increase our fund of knowledge. We have not the resources that some governments have.

I noticed the other day in a dental journal an article in which it was stated that more information in pathological research has been gathered within the last fifteen years than in twenty centuries before. That is a broad statement, and I think it will have to be taken *cum grano salis*. If we go back and say fifty years we will probably come nearer the mark, because it was nearly forty years ago when Rokitansky advanced his theory; it was thirty years ago when Virchow gave us his cellular pathology; it was twenty years ago when Cohnheim gave us the migration of the white corpuscle

theory; and while each one of these theories have, perhaps, had their day, and there is no doubt but what there is an element of truth in each one of them, there must be some foundation for us to rest upon.

The essayist has brought to your notice each one of these theories. There is another theory that I expected him to have brought to your notice, and I cannot account for his overlooking it, unless he considers that it is swallowed up, and that is the bioplasm theory of Beale, which is not quite as old as the theory of Virchow. He claims that new cells are made up from the bioplasts; that they are the germinal vessels swarming about in nutrient fluids, and that they come from the white blood corpuscle. These three theories cover the ground. But do they give us the history of the formation of a pus corpuscle? The question is whether the corpuscles migrate from the vascular system, and it has been said it was doubtful whether it was brought about by diapedesis or not. I believe, however, that this is the accepted theory of the later pathologists. I know of no other theory that can take its place—how diapedesis is produced. The fact still remains, how do these corpuscles find their way into the intervascular spaces, and there begin work? It is absolutely necessary, to make this subject intelligent to us and to make us feel what the object of these cells is, to find out what work they perform after they get into these spaces. They are certainly not dead tissue, or they would not be there. They are there for a specific purpose. If they are not dead, we must have live tissue. If, then, they are live tissue, they certainly must possess the power of absorption, digestion and nutrition.

It is a matter of too great importance for us to enter the human frame to prove or demonstrate this theory; but the same literati of older countries have come to our rescue and have proven it for us. They have placed their views upon record, and all we have to do is to look them up.

In 1881 or 1882, Metschnikoff, one of the greatest pathologists, by means of experiments upon the water flea, an almost transparent animal, proved that upon the body of this flea were numerous animal parasites. These parasites have been designated by pathologists as conidiæ. Under a powerful microscope he watched these parasites as they migrated from the capillaries, and found that the conidiæ were gradually absorbed by the leucocytes. If the



conidia was too large or too great for one leucocyte, another leucocyte would come to its rescue, and two of them would unite for the destruction of the conidiæ. When it became necessary for the leucocytes to unite, he changed the name and called them phagocytes. After the cells came together they absorbed the conidiæ, the conidia being taken into their body and there digested. If the process of life goes on and digestion is started, there is some waste matter. Therefore he watched, sought and found that this waste was poured out in a state of liquifaction into the cellular tissue, and then became poisonous, and the poison produced mischief.

It is said that this theory is applicable to man, which is demonstrated by the same author, and can be found in any work on pathology. It has been summed up that these phagocytes might be likened to a standing army of the human family or animal organism. The micro-organisms are the invading army, by which they are attacked. Their route is the blood vessels and the different tissues of the body. The leucocytes stand by as a matter of protection against any outside invasion. Now, if this theory be true, some soldiers must be lost in battle; consequently many leucocytes are lost sometimes in the attacks made by the enemy, or micro-organisms.

The point arises whether there can be any pus without micro-organisms. Let us not go too fast in our conclusions upon this point. If so great a man as Atkinson, of New York, in the seventh decade of his life, claims that, during the last five years, he has had to unlearn what he thought he had already known—and he was a hard and diligent student—it behooves us to be careful lest we fall into the same rut.

I do not believe that micro-organisms are absolutely necessary at all times for the formation of pus. I believe that we can have pus without micro-organisms. It may be that I will have to coincide with the essayist, that there is such a thing as laudable pus, and then designate it as a pus that does not contain micro-organisms.

Professor Grawitz has been inoculating animals for the last six months to prove there can be pus without micro-organisms. He has proven it in both ways. He made one experiment upon a rabbit and another upon a dog. The two animals are not alike, so far as their susceptibilities to pathological conditions are concerned. He takes next a guinea-pig and dog, and in one of them produces

pus with micro-organisms, while in the other case he produces pus without micro-organisms.

Then again, Prof. Knapp, of New York, and other specialists have shown that by using turpentine and other irritant substances, we can produce pus. In some instances it has been produced; in others it has not. Let us be satisfied for the present. I believe I am right in stating that the ptomaine simply takes the place of the turpentine, or that the turpentine takes the place of the ptomaine, and that the satisfaction or proof to our minds has yet to be brought to us.

DR. A. E. BALDWIN: I feel that the society should be appreciative of these two papers, because they embody in an epitome a great deal of research by learned men. While I enjoyed listening to them, I must say I could not arrive at the conclusions reached by the essayist in all particulars, especially with reference to the second paper, wherein the statement was made—to me erroneously—that if micro-organisms are present we have pus. The statement was not exactly made in that way, but the idea was conveyed that we should call the fluid which resembles pus by some other name if we did not discover with the aid of the microscope the presence of micro-organisms.

I believe that there are a class of students in our dental ranks who are more prone to read and believe those things which tend to substantiate their pre-conceived ideas rather than those antagonistic thereto.

There are no reputable authorities which claim the contrary. We have a number of noted men who claim that the position taken in regard to the formation of pus is erroneous. It is not a walk-away on the one side or the other. I may be called a skeptic; I presume I was born suspicious, but I never could believe because somebody else said so-and-so, it is true, unless sufficient reasons were given for that truth. That we have micro-organisms present in pus formation in a great many cases is a statement that no one can gainsay; but that this proves that they are the cause of pus is another thing.

If the gentlemen present have been studying this question the length of time that I have—about fifteen or sixteen years—they will realize this fact: that in medicine and among medical men there are no class of scientists that are so liable to ride hobbies as

they are, and we cannot deny our parentage. We belong there ourselves.

About fifteen or sixteen years ago the theory was advanced—although it has no direct connection with this subject—which shows you how eminent men, after having proven certain things, and the thinking world has adopted their ideas, have finally discovered that their ideas were erroneous. I cite you Claude Bernard, one of the greatest physiologists that ever lived. About that time he discovered what he called the centralization theory of sensation, certain portions of the brain giving rise to certain manifestations. When I was a student in college, this theory was demonstrated to us on dogs. We furnished the professor with a large number of dogs—about 300. He demonstrated to us clearly that this theory was true; that certain territories in the brain gave rise to certain sensations, and irritation of those portions of the brain would cause a corresponding irritation in a portion of the body to which that branch of the nerve sent its afferent branches. Just about the time the world accepted that theory Dr. Bernard discovered the error of his way, and determined that there was no such thing as localization. He proved this just as conclusively as he had proven the other theory. To-day we find very few medical men who believe that the localization theory is correct.

There are a great many other theories that I might speak of that have captivated the medical profession for a time, they dropped away from them. You remember the time when Harvey discovered the circulation of the blood. It seemed absurd for him to demonstrate such a thing. The discovery of the vaccine virus by Jenner was combatted for a long time. We find very few people to-day but what accept the truth of the statements made by Jenner.

It may be that time will demonstrate to us that the statements made by the authorities which have been quoted in regard to micro-organisms causing pus will be just as accurate; but I do not think from present researches and investigations, we can say it is proven that they are the causation of pus in all instances.

One of the essayists tried to prove that in order to have putrefaction we must have not only the presence of air, but the dust in the air. If you were medical men and had a ripe case of periostitis and thrust the knife deep into the tissue and get pus welling out in large quantities from that enclosed, circumscribed space, you would



naturally inquire, how did it get there? And not only how can air get there, but how did the dust in the air get there?

I must take exception to the statement made by one of the essayists, that Pasteur claims that there are micro-organisms which work best where there is no oxygen. That is not true, as our later demonstrations seem to prove. Oxygen is necessary to life, to anything and everything, without regard to what it may be in the line of organisms. If you admit that micro-organisms must be present in the system of an individual with suppurative periostitis, then you must admit that the use of local applications are unnecessary, because if the micro-organisms you are fighting are present throughout the whole body, what is the use of your trying to drive them away from the outside when they are inside? What is the use of antiseptics? And, gentlemen, you may think that is a rather light statement to make, but there is a good deal more truth in it than your micro-organism theory people want to admit.

If you remember the work of Lawson Tait and his fellow-worker, Mr. Bantock, and the statements they have made before the English-speaking world, you will find that there is no theory about it, it is a statement of absolute practice.

I understand from these papers that we must keep the atmospheric air from wounds, or else we will have suppuration—in other words, we will have putrefaction.

Mr. Tait was a fellow practitioner with the celebrated Lister, the originator of the antiseptic treatment. They performed more than any other operation in surgery, ovariectomy, and they based their conclusions upon the presence or absence of suppuration in these cases. Mr. Tait does not use any antiseptics whatever. He has not used any for fifteen years. Mr. Bantock has not used any for the same length of time or nearly so. Mr. Tait has made a tabulated statement of four hundred cases of ovariectomy, wherein he discusses the Listerian principle of antiseptics. In the first one hundred cases he practiced Listerism; in the second he partially discarded it; in the third he discarded it entirely, and in the fourth he used nothing but hydrant water. He went to the hydrant and washed his instruments, his hands, and washed the abdomen of the patient with the same water, and after having opened the abdomen and tied the pedicle, he turned hydrant water into the abdominal cavity and washed it out. His results have been very successful.

I want to emphasize one point, namely: Suppose you have two abscessed teeth, or rather you have two teeth with dead pulps in them; in one of them the pulp is undergoing putrefaction, and you have an inflammation of the pericementum. You drill through into the pulp chamber of the tooth and allow the atmospheric air to enter, and the result is you get wonderful relief. The relief will be so great that you will cure the patient in a very few days. In another case you open into a mummified pulp, which for a number of years gave no trouble, and you have a violent irritation. If we only had the one case you would, perhaps, say it was owing to micro-organisms. If you open it you would let the micro-organisms loose, and thus allow nature to heal the part.

Cleanliness is to be commended, and the more we depend upon antiseptics to produce asepsis, the worse we will be as dentists. The more we depend upon cleanliness, pure and simple—and what I mean by cleanliness is just what Mr. Tait means by it, that is, getting the dirt off our instruments, etc.—the nearer we will be to science proper, and the more we will be in the line of progress.

DR. A. W. HARLAN: I was contented in listening to the speeches and had made up my mind to say nothing. Still, I do not know but this subject is of as much interest to us as filling teeth, or making artificial teeth.

I am acquainted with all the theories on fermentation and putrefaction, and with the history of the subjects, dating back more than two hundred years, and all these point in one direction. At the present time there is not more than one reputable authority in the whole scientific world who disputes the micro-organic theory of putrefaction and fermentation. I refer to Professor Morris Longstreth, M. D., of the University of Pennsylvania, who has written the ablest paper that has been produced in the last ten years against the theory of fermentation and putrefaction by the aid of micro-organisms. It is the most concise argument in favor of the non-microbic theory of putrefaction that there is in the English language to-day, and I have read it with a great deal of interest. I have discussed it with Professor Danforth, of this city, and have questioned in my own mind whether the long line of investigators on this subject were not wrong. Dr. Danforth said to me—and most of you know him—small in body, but a giant in intellectual fertility—"If you adopt the theory of Longstreth you place yourself in the rear guard. It will not do; the evidence is too strong."

I am aware of the fact that there is a fluid which can be produced in an alkaline solution which will simulate pus, and that it can be produced without the aid of micro-organisms, but it is not pus. The microscope of no investigator up to this time has been able in such alkaline fluids to demonstrate the presence of micro-organisms, but in every case, so far as I know, according to the reading that I have been able to give to this subject, pus, when examined critically, has been found to contain some form of minute organism.

A few weeks ago I took the trouble to read what was said on the subject of fermentation in Watt's Dictionary of Chemistry, the latest work on the subject that has come into our scientific literature. I also read with a good deal of attention the article on fermentation in the *Encyclopædia Britannica*. I have read other articles from time to time, many of which are mere compilations. We do not have very much original work in this respect. One gentleman goes to work and writes an article on fermentation or putrefaction and culls all the literature published in the English language, and if he perchance understands the German or French language, he extracts liberally from such sources, and some of those listening may perhaps say, what a profound scholar and investigator we have had speaking to us.

Gentlemen, anything that I may say this evening is not derived from original research or investigations. I do not know anything about it except from examining authorities and the weight of authority, which Dr. Baldwin in denying the micro-organism theory of suppuration himself practically admits is true when he speaks of Jenner's discovery. What is the inoculation of the human subject with the vaccine virus but the planting of microbes which produce pus?

DR. BALDWIN: I did not state that I was opposed to the micro-organism theory. I simply said that I do not think it has been clearly proved.

DR. HARLAN: I am glad to be corrected. I understood from the speech Dr. Baldwin made this evening that he was an unbeliever in the microbic theory, and in proof of his position he stated with reference to the discovery of Jenner that people at first scoffed at it, that they did not apparently believe it, but that in the course of time it was accepted. I say the discovery of Jenner and the protection that is afforded to the human race by it is proof alone, if nothing else



were needed, of the fact of the micro-organic theory of fermentation, putrefaction, and the production of pus.

DR. BALDWIN: I tried to make plain to you when I was on the floor before that I did not think it was clearly proven that micro-organisms are necessary for the formation of pus. I hope the matter may be definitely settled some time in the near future, so that we may all know what is right. Because Jenner proved a certain thing in regard to one peculiar organism, I do not think that that proves all, and the world certainly has been very slow in accepting the truth of his theory. I do not know anything about this matter except what I read. I have read what I supposed to be articles written by scientific men. We are informed that there is only one scientific man that has ever written anything on the other side. I believe there is some ground on the other side, and I want to say that we can never learn much by studying one side. If you want to learn the whole truth study the two sides of the question.

DR. J. N. CROUSE: The questions under discussion have impressed me very forcibly. A patient who recently died, and whose mouth I took care of for a long time, was affected with pyorrhœa alveolaris. He came to me apparently feeling as well as he ever did, with what I supposed was pus welling out from around the necks of the teeth. Whether it contained micro-organisms or not, I could pick a tooth out with my finger. This process went on for years. I applied a saturated solution of iodine and carbolic acid around the necks of the teeth. Within late years the disease had entirely disappeared. What takes place now? In his full vigor, apparently in the best of spirits, he drops dead. Did the process of pyorrhœa alveolaris stop? He died from a broken blood vessel in the brain.

I do not like the study of anything which is so uncertain as the subject of pathology. In the medical world we find men who have spent their whole lives in establishing theories, and some other fellow comes along and knocks them over. We want something that is more reliable. I am glad somebody is investigating these subjects, yet there is not much to be glad about. When one pathologist knocks out the theories of another, I begin to wonder sometimes whether we are ever going to have some things which are at present in dispute, definitely settled.

DR. CLIFFORD: Have you ever treated the teeth of other patients with the saturated solution of iodine and carbolic acid?

DR. CROUSE : Yes, I use it freely around the margins for simple pyorrhœa alveolaris, and I consider it one of the best remedies that I know of.

DR. CLIFFORD : How long have you been using it ?

DR. CROUSE : I have been using it, I think, for the last twelve or fifteen years. I have always used it in those cases which come to me for temporary relief.

DR. W. G. STOWELL said he was a believer in specifics for specific diseases. A patient came to his office January 6th whose case somewhat confused him. It was similar to a case which he had some six months ago, and during the treatment of which he ascertained the fact that the patient had just recovered from an attack of gonorrhœa. He diagnosed the case as a suppurative inflammation of the gums which had assumed a gonorrhœal form, brought about by the micro-organism which produces gonorrhœa (the gonococcus of Neisser). He believed that there was some specific poison there which produced the inflammation of the gums. A case that came under his observation last summer had the same symptoms as the one he saw recently, and he had no doubt but what the inflammation was of gonorrhœal origin.

DR. ROYCE : There is a similarity in the process of putrefaction and fermentation, and while some fermentative processes may be produced by micro-organisms, there are others which are produced without them. I have been unable to find any record of putrefaction being produced without the aid of micro-organisms.

DR. KESTER, in closing the discussion, said : It is well enough to study this question, so that we can have a reasonable excuse for having a theory.

I have been interested in this subject from my college days. I asked a Professor of Surgery what pus was, and suggested in a note if it was not dead leucocytes ? He said, "No." I quoted him to-night. I have been interested in it ever since the microbic theory of suppuration struck me as being the most reasonable of all theories as yet advanced. It seems to me that I tried to make that clear in my paper. I mentioned that inflammation itself was not a disease, but a restorative process, and that if the process were allowed to go on without interruption, or without the intervention of anything foreign to the system, the inflammation would restore the process without the production of either putrefaction or of suppuration.

I think it is possible to make a distinction between putrefaction and suppuration. Suppuration has to do with the living, and putrefaction has to do with the dead. They are both produced by a micro-organism, but not the same organism. Soluble ferments are not microbes, as I understand them.

It seems to me, in studying the researches and experiments that these gentlemen have made, it has been clearly proved that all pus contains microbes, except in those cases where it has been produced by the foreign substances which have been mentioned—turpentine, etc. The reason that certain internal abscesses are formed, I believe is because the condition of the part is in such a state as to allow a proper place for the propagation and growth of the microbe which finds its way there.

Rabbits have been inoculated with pus microbes in sufficient quantity to produce abscess ordinarily. Their bones have been broken in another part of the anatomy, and the suppurative stage has developed at the site of injury, and not at the place of inoculation, and I believe that that is a sufficient explanation that there is a depot of infection somewhere in the system.

Dr. OTTOFY has told us that there are about eighteen different kinds of microbes which are always present in the mouth, and it seems to me it can be explained in this way: That it is absolutely necessary to have micro-organisms to have established a suppurative process.

DR. BALDWIN: How would you explain the fact of a compound comminuted fracture healing without suppuration, and before it had thoroughly healed a felon appears on the finger with a secretion of pus?

DR. KESTER: I should say that the vital force of the system in the case of the compound comminuted fracture was sufficiently good in the healing process to throw out a barrier against the ingress of micro-organisms. In the case of the felon, I should say that the microbe found a favorable condition at that point to plant itself and to develop.



## INTERNATIONAL DENTAL CONGRESS.

Summary Report of the Work of Section Two. Reported by  
M. P. DUBOIS, Secretary.

(Translated from *L'Odontologie*, for the DENTAL REVIEW.)

[Continued from page 46.]

COMPARATIVE VALUE OF GOLD AND OF PLASTIC SUBSTANCES FOR THE  
FILLING OF TEETH, WITH A REVIEW OF RECENT  
PROGRESS IN THE MATTER.

M. Heidé, of Paris, read a paper on "Filling Cavities with the aid of Pieces of Enamel from Natural Teeth."

His conclusions are :

"By the inlaying of pieces of natural enamel one obtains a restoration of decayed teeth calculated to deceive the most practiced eye. From an æsthetic point of view and also from the standpoint of durability, these fillings are superior to plastic ones. The difficulty of properly adjusting them is as great as the packing of gold in difficult cases ; but in view of the favorable results, one is willing to surmount obstacles. In mouths where erosion has deformed a tooth, and also where there is loss of substance on the visible portions of front teeth, this practice is favorably advocated."

M. Guerini, of Naples, praises the use of coral for fillings. He says :

In order that a substance may be useful and practical in filling teeth, it is necessary that it should have the following qualities : It should be first of all easy of manipulation, and it should be about the weight of dentine. It should not convey the disagreeable sensations of heat and cold to the pulp, and should present the greatest possible resistance to the wear of mastication and the action of the saliva. It should not injure the tooth, nor change its color as do amalgams, and finally it should admit of being easily removed in case of necessity.

Coral presents all these qualities, and it has a resistance superior to all cements.

It is now a year that I have employed coral in filling teeth, with great success. I use pieces of different sizes and shades, and find it very advantageous.

M. Eilertsen, of Paris, read a paper entitled "The Restoration of Tooth Substance." He says :

"We choose, among known substances for fillings, the one which is most solid, and cover it with a fitted fragment of enamel. I use gold, or, better still, a veneering of platina, fastened with gold or amalgam, to do it as rapidly as possible; the piece of enamel is riveted thereto by a small pin of soft platina which I make myself. We may resort to rings and metallic crowns. These rings and crowns made of platina can be enameled on all visible parts."

M. le Docteur Gaillard, of Paris, read an essay on "Utilizing the force of the muscles of the jaw for the condensation of metallic foil used for fillings." The author passes in review the different means employed for condensing gold. He has measured the force obtained by the mallet. It gives only five to nine kilogrammetres to the square centimetre, while the jaw can give as much as fifty. The mallet might, by its vibrations, cause cerebral disturbances. In making use of the muscular force of the jaw to finish the condensation of gold, one relieves the patient, both by simplifying the operation and lessening its duration."

M. le Dr. Gaillard exhibited a tongue depressor, to hold the tongue out of the way. The depressor can be used for either side. He also exhibited an electric mouth-lamp, which illuminates the mouth thoroughly. He also exhibited a set of jointed condensers, capable of receiving the different points of the series, by a very simple mechanism, assuring steadiness to the instrument.

#### DISCUSSION.

M. Poincot: I have for a long time used Dr. Gaillard's condensers with perfect satisfaction.

M. Chauvin: Dr. Gaillard tried the condensing force of his instrument upon a gold filling put in by me at the clinic this morning. Although the gold was very closely packed, he was able to compress it still more, which surprised me, knowing the force exerted. I find his instruments superior to those of Flagg and Bing.

M. Rollin, of Paris: Do you never have accidents from too much power?

M. le Dr. Gaillard: No. As to the form of the exterior of the filling, that is only of secondary importance.

M. Spaulding presented, in the name of Dr. Sachs, of Breslau, two jaws in which the upper and lower teeth show different kinds of fillings.

M. Poinsoot recommended the washing of amalgams with the following liquid :

Petroleum oil.....	100 g.
Volatile alkali .....	10 g.
Chloride of zinc.....	5 g.
Saponin .....	1 g.
Shake well before using.	

One extracts in this way a large quantity of metallic oxide which disintegrates the finished filling.

M. Harlan, of Chicago, made experiments showing the effects of volatile medicaments in dental therapeutics. He described these in his paper entitled : "The diffusibility of medicaments in living and dead dentine."

M. Etchepareborda, of Buenos-Ayres, read a paper concerning the influence of rheumatism in producing diseases of the mouth and particularly of the dental system.

In connection with rheumatism, M. Etchepareborda has observed the following diseases of the mouth :

1. Resorption of the alveoli.
2. Simple and ulcerated inflammation of the gum.
3. Inflammation of bone and of the sockets of the teeth.
4. Alveolar periostitis.
5. Dental necrosis and spontaneous falling out of teeth.
6. Facial neuralgia.
7. Inflammation of the body of the maxillæ.
8. Caries and necrosis of the maxillæ.

He concludes thus :

*First.* The teeth, the maxillaries and the soft parts of the mouth, are frequently the seat of difficulties of rheumatic origin.

*Second.* These conditions may precede, follow or accompany manifestations of articulatory, muscular, fibrous, etc.; acute, sub-acute or chronic disease. They may remain isolated a long time and constitute the sole visible expression of disease.

*Third.* The most frequent disturbances of rheumatic origin are:

1. On the part of the teeth :
  - a. Alveolar inflammation.
  - b. Osteo-periostitis of the dental sockets.
  - c. Dental necrosis.
  - d. Spontaneous falling out of teeth.
2. On the part of the nervous system :



Facial neuralgia, corresponding with one or another of the branches of the trigeminus.

3. Relating to the maxillæ: Alveolar resorption, decay and necrosis of the maxillæ.

Neither of these local affections can be regarded as an affection proper to rheumatism. They are to be observed, with the same features, in subjects who are not rheumatic; they may have a local or a general origin. It is impossible to fix their place in the chronology and order of succession of rheumatic difficulties. In general, however, these manifestations are late. Their maximum frequency occurs in middle age—from 25 to 40 years.

4. It is above all in vague and chronic forms that one observes rheumatic manifestations. They alternate quite often with others. In chronic forms, for example, a sub-acute pressure on the part of the fibrous tissue of the joints, or the muscles, is often followed by retrocession of the buccal irregularities. These do not constitute in any way a *noli me tangere*. One can treat them without fear of localizing diathesis of the same order, and of a more serious character. It is even indispensable to treat them because of their rapid progress. One should at all times remember in observing indications, the substratum of rheumatic diathesis, in order to know if general medication is needed simultaneously with local treatment.

#### THIRD QUESTION—LOCAL ANÆSTHESIA.

M. Poincot, disliking the instability of the aqueous solutions of the chlorhydrate of cocaine, recommends the solution that he has made known: pure cocaine in oleo-naphthine and the oil of arachide. This composition diminishes the toxic power of the coca.

He read a communication entitled "Employment of pure cocaine injected in the tissues of the gums," giving the following receipts:

##### MIXTURE NO. 1.

Oléo-naphthine.....	50 centigrammes.
Oil of arachide.....	150       "
Pure cocaine.....	5       "

##### MIXTURE NO. 2.

Oil of arachide.....	66 centigrammes.
Oléo-naphthine.....	33       "
Pure cocaine.....	5       "

The formula being:

Oléo-naphthine.....	1 gramme.
Pure cocaine.....	0 gr. .05 centigr.

By the judicious employment of these formulæ I can give you the assurance that you will be satisfied to make use of them when you have need of a harmless local anæsthetic.

M. Richard Chauvin read a paper entitled "Essay upon Cocaine." He attributes the undeniable accidents incident to the use of cocaine to its chemical instability and other alkaloids contained in the greater parts of the extracts of coca. He adds some advice upon the mode of administering the anæsthetic agent.

M. Bleischteiner, of Gratz, read a paper entitled "Injections of cocaine as a means of local anæsthesia." He recapitulated :

1st. The effect of injections is very favorable when one makes them in inflamed and swelled gums.

2d. The duration of the anæsthetic is almost always ten minutes.

3d. Five per cent solutions of cocaine are sufficient.

4th. As a general rule it is not necessary to inject more than five centigrams of cocaine at one time. Operating at intervals of a half hour, the dose can be increased to 15 centigrams.

5th. It is necessary to make the greatest possible number of punctures, and to allow the least possible amount of cocaine to penetrate at each injection.

6th. The injections once finished, one should proceed immediately to extract.

7th. When one has many operations to perform, it is not best to thrust the needle in the neighborhood of the wounds produced by preceding extractions, for fear of a too great absorption of the medicament.

8th. In the case where collapse supervenes, I advise a horizontal position, and the administration of alcohol or wine. Nitrite of amyl should be used.

9th. In hysterical attacks it is well to make an injection of a ten per cent aqueous extract of opium.

M. le Dr. Dunogier treats the same question in a communication entitled "Local anæsthesia by the use of cocaine." He considers the solution in distilled water to be most commendable, and thinks the addition of phenic acid useless and dangerous.

M. Hugenschmidt, of Paris, read a paper on "Considerations of the physiological action of cocaine; means of avoiding it."

For the author it is easy to combat the trouble arising from cerebral anæmia, by first administering a stimulant, cognac, for

example, and when there is syncope, causing the patient to lie on his back in a horizontal position. Inhalations of ammonia, or of nitrite of amyl are equally useful.

M. Caracatzanis, of Athens, read an essay entitled : "Chlorhydrate of Cocaine as a Local Anæsthetic." He had variable results, and has desisted from employing this agent.

#### DISCUSSION.

M. Chauvin : The doses employed by the preceding speaker are too large ; two and a half centigrammes, are sufficient to obtain anæsthesia.

M. Mousis, of Paris : A simple phenic solution acts like cocaine.

M. Thuillier, of Rome : We administer cocaine in equal doses, yet with different results. We proved that at this morning's session when the operators had difficulties with the small doses, they obtained a perfect anæsthesia with larger ones. In any case it seems to me that five centigrammes surpasses the permitted dose.

M. Schwartz, of Nimes : I will ask M. Bleischteiner if he always operates immediately?

M. Bleischsteiner : Always.

M. le Dr. Abonyi, of Buda-Pesth, read a paper on "The Bromohydrate of Ethyl."

#### DISCUSSION.

M. le Dr. Iszlai, of Buda-Pesth : M. Abonyi, of Buda-Pesth, has succeeded perfectly in the numerous experiments he has made.

M. P. Lehr, of Bouxwiller : I have employed it also, and have obtained good results.

#### UNCLASSIFIED PAPERS.

M. Hugenschmidt, of Paris, read a paper on "Dental Implantation." Observation leads him to believe that implanted teeth sustain as well as others, the consequences due to a bad state of the general system. The means of union are a kind of bony ankylosis, and a condensed osseous formation which can retain the tooth indefinitely in the maxilla.

#### DISCUSSION.

M. Meng, of Paris : I have operated twice for implantation, and have succeeded. The first tooth did not fail till nearly the end of two years, and the second remains fixed.

M. Schwartz, of Nimes : Some operators say that success is dependent on the presence of the cement, while others believe that this is of no consequence. It would be well to have the question settled.



M. Cunningham, of Cambridge: I have made 80 implantations, of which a large number may be called experiments. I do not believe that implantation can be practiced in a general manner. An article published in the *Cosmos*, shows fifteen failures in a hundred operations. Time will augment the number.

Although it is difficult in England, I have made experiments on dogs and they were not encouraging. I do not agree with M. Huguenschmidt in any marked influence of general nutrition.

M. Barrié, of Paris, exhibited an appliance for compressing the gum in cases of hæmorrhage. It is a clamp with a dam; and to this mechanical contrivance M. Barrié adds cotton saturated in a solution of cocaine, and with it he has obtained the best hæmostatic effects.

#### DISCUSSION.

M. Barrié also presented two other apparati of thin platina, for the retention of reimplanted teeth. He showed their superiority over other means of retention of grafted teeth by the immobility, facility in cleaning, and the comfort to the patient.

M. Chauvin: I have employed all approved means for reimplanting teeth, and I have found none which were so simple as M. Barrié's. I ought to say that sometimes I have succeeded without it when the rubber was well adjusted.

M. Franck, of Vienna, read a paper concerning dental hæmorrhage and the means of combating it by the application of the rubber dam.

M. Dubois read from M. Lecaudey, of Paris, who was detained, a communication on the "choice of antiseptics in dental surgery."

His conclusions were:

- 1st. It is necessary to consider in the choice of antiseptics, not only the local state, but the state of the constitution of the patient.
- 2d. Chloride of zinc and phenic acid are especially useful with robust persons without organic disease or defect.
- 3d. Iodoform and iodol are preferable in the case of scrofulous or tuberculous persons.
- 4th. For syphilitics, the best antiseptic that we can employ, is the 5 in 1000 solution of sublimate.

(TO BE CONTINUED.)

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CROWDED OUT.

Much interesting matter had to be crowded out until next month,

# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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THE "ANNIVERSARY" OF THE FIRST DISTRICT DENTAL SOCIETY.

The First District Dental Society celebrated its twenty-first anniversary, beginning Tuesday evening, January 14th, continuing through the 15th and 16th. The first evening was devoted to the usual opening exercises, followed by an address of welcome on the part of President Northrop, which was happily responded to by Dr. M. W. Foster, acting as the representative of the visitors. Dr. J. N. Crouse, of Chicago, then made a short address on behalf of the "Dental Protective Association," which was well received. He was succeeded by the essayist of the evening, Dr. E. S. Talbot, of Chicago, who read a paper entitled "Fallacies of Some of the Old Theories of Irregularities of the Teeth," with some remarks on diagnosis and treatment. Dr. Barrett opened the discussion. His remarks were mainly directed to controverting the views of the essayist, and he argued that we must return to the primal type in order to study the subject intelligently. Dr. Barrett had displayed before the audience a collection of skulls of various animals, including the carnivora, herbivora, gorilla and man's. He emphasized the fact that comparative dental anatomy was a subject scarcely treated upon in dental collegiate instruction. Drs. Guilford, Kingsley, Bonwill, Jackson, Watkins and others followed. The paper created a prolonged discussion, which was extended to the following afternoon, from 3:30 p. m. until adjournment.

The joint paper by Drs. Darby and Kirk, "The Manual Training Idea as a factor in Dental Education," was only read by title, as the authors were confined to their homes by reason of illness. Wed-

nesday evening Dr. Geo. S. Allan read a paper on the subject of "Theory and Practice in the Treatment of Proximate Surfaces." The discussion was opened by Dr. Harlan, who was followed by Drs. Pierce, Atkinson, Ottolengui, Truman, Perry and others. It was necessary to hold an afternoon session Thursday, the 16th, in order to close the discussion on this paper.

There were about 350 members and visitors present during the meeting. For the first time in our experience in attending dental society meetings, two papers held the attention of such a large number of auditors during two evenings and two afternoons. This speaks well not only for the society, but for the essayists. In both cases the views of the essayists were attacked in the most vigorous manner, but the speakers were good natured throughout and they were listened to with marked attention. Next month will be published a summary of the whole meeting, including the clinics, to which our readers are referred.

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#### MASS MEETING.

A mass meeting of dentists was held at Clark's restaurant, in New York, the evening of January 16th. Dr. O. E. Hill acted as chairman. The following resolution was unanimously adopted:

*Resolved*, That we thoroughly endorse the Dental Protective Association of the United States, and urge upon every member of the dental profession to join the Association, and send to Dr. J. N. Crouse, of Chicago, its president, the initiation fee of ten dollars.

WM. JARVIE, *Secretary*.

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#### COLLEGE EXAMINATIONS.

The latter half of the term in our colleges has just begun. The final act in the drama of dental education—the examinations—will soon be played. We have used the term drama; it was a slip of the pen. We had better said comedy, and possibly in many instances, farce would have been the word.

At best, an examination, as ordinarily conducted, is a poor criterion of a student's standing. It tells us nothing of his mental calibre, of his judgment in critical cases, of his status in the community as a man and a gentleman, and very little does it prove of his manipulative ability. It is merely an evidence that he has been more or less successful in getting by rote certain rules and formulæ, has grasped in a greater or lesser degree the wording of theories, and is capable, or not, of placing them upon paper. There is noth-



ing to show that he can apply these theories, not even that he understands them. His success in examination is limited only by his ability for memorizing.

In short, an examination gives no indication of what the future dentist will be, and our faculties cannot tell, by present methods, whether the men they are sending out will honor the profession or disgrace it. The fact that it is often the latter, should rouse our colleges to the realization that there is something wrong with the system.

One fault probably lies far back of the final examination, and is outside the range of this article. Gold cannot be refined from dross—good dentists cannot be made from the material that is often admitted to our colleges. Stop the evil at its source and we may purify the stream.

But something of reform may result from proper methods of examination. A complete system of examinations should go on from the beginning of the course to the end. Students should be required to apply the theories as they learn them; the greatest fault in college training is lack of practical application. Competent instructors—and the lamentable fact confronts us right here that there are few *natural teachers* in the profession—should be employed to guide the student and watch from day to day his progress in the infirmary, for here the real question of his ability is best judged.

Then his standing should be regulated according to the general average through the course rather than by one examination at the the end. The practice of graduating a student on the strength of a few scrawling pages written on each subject at the close of the session is a disgrace to the profession and an outrage on the public.

The demonstrator in each department should be a man of rare judgment, and should study the merits of each student closely. Especially should the senior be watched in his work during the last half of the final term, and if he prove incompetent in those branches which will demand most of his attention after graduation, he should not be allowed to pass. Mistaken charity in letting a man graduate without qualifications often results in a permanent drawback to him through all his future practice.

One point more regarding examinations—a point delicate to approach. Of course a final examination should be held always before graduation, and it should count to a degree in the result;

but there is one evil in connection with these examinations which has in many instances rendered them totally valueless. That evil is "cribbing" on the part of the students. This matter is religiously shunned, so far as open utterance is concerned, by the faculties and the profession, the one pretending it does not exist, the other admitting—practically—that it does not care. The time has come when we may not ignore it—it is too real; when we may not wink at it—it is too serious.

Let every professor see to it that his examination is conducted in such a manner that each student writes what he knows, and nothing more; to the end that this wholesale graduation of incompetent men is in some measure restricted.

The DENTAL REVIEW welcomes every honest, capable man to the profession; it is death on the delinquents.

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## FOREIGN CORRESPONDENCE.

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### CONCERNING THE DENTAL SECTION OF THE TENTH INTERNATIONAL MEDICAL CONGRESS.

In response to a call of the Organizing Committee (Professor Virchow, von Bergmann and Waldeyer) fifty delegates from the various universities and medical societies of Germany met in Heidelberg on the 17th of September, 1888, to take steps in the organization of the Congress. At the meeting it was decided that the Congress should be held in Berlin, beginning August 4th, and closing August 10th, 1890.

An Organizing Committee, consisting of Profs. Drs. Virchow, von Bergmann, Leyden and Waldeyer was elected, and a General Secretary, Dr. Lassar, appointed.

Eighteen sections, including Dental Surgery, were organized, each with a Special Committee of nine members.

An international medico-scientific exhibition is to be connected with the Congress. Statutes and programmes were adopted which will be given in-as-far as they particularly concern the Dental Section.

ARTICLE II. "The Congress consists of physicians (approbirten Aerzten) who have registered their names and obtained their membership cards. Other savants who are interested in the work of the Congress may be admitted as extraordinary members."

The delegates did not see fit to change this article so as to include dental surgeons, but decided that the article should be so interpreted as to admit dentists to membership. Since the meeting at Heidelberg the question has been raised whether dentists resident in Germany, but not possessing the German dental approbation (degree), could be admitted to membership. Regarding this point, the Chairman of the Committee of Organization decided that only those who possess the recognized degree of that country of which they are citizens may be admitted to membership.

A German citizen holding only an American or Swiss degree is, therefore, not entitled to membership, no more is an American or English citizen not possessing the degree of his own country; on the other hand, foreign citizens practicing in Germany are admitted without the German degree, provided they have the degree of their own country.

Members pay a fee of twenty marks, and receive a copy of the transactions.

ART. III. The object of the Congress is exclusively scientific.

ART. X. All lectures and communications in the general sittings, or in those of the sections, must be handed (in writing) to the Secretary before the close of the sitting. The Editorial Committee decides whether, or in what part, such communications shall be included in the published transactions.

ART. XI. The official languages of all sittings are German, English and French. Very short remarks may be made in other languages, provided some member is prepared to translate them into one of the official languages.

ART. XII. Lectures are, as a rule, to be limited to twenty minutes; discussional remarks to ten minutes.

ART. XIV. Students of medicine, and other persons, gentlemen and ladies, who are not physicians but are interested in the proceedings of any particular session, may be invited by the President of that session, or, on application, receive permission to attend as auditors.

There are to be no vice-presidents associated with the congress, but each section is empowered to elect a limited number of honorary presidents and a secretary for each of the official languages.

The committee of the dental section is composed as follows: Busch, Berlin, Chairman; Calais, Hamburg; Hesse, Leipzig;



Fricke, Kiel ; Holländer, Halle ; Miller, Berlin ; Partsch, Breslau ; Sauer, Berlin ; Weil, Munich.

At a meeting of this committee, held on the 16th October, 1889, it was decided that the hours from 9 to 12 a. m., should be devoted to practical demonstrations in the rooms of the dental institute, the demonstrations to consist of operations in filling, extraction and in mechanical dentistry ; in short, operations in all branches of operative and mechanical dentistry.

Demonstrations in extraction and in artificial work are to be under the direction of Prof. Busch, those in filling under that of Prof. Miller. The theoretical exercises, etc., are to be held from 2 to 5. They will consist of the usual essays or lectures and the accompanying discussions ; besides these, three subjects for general discussion are to be chosen : one to be introduced in the German language (on bromide of ethyl, by Prof. Dr. Holländer), one in the English and one in the French language.

Those desiring to deliver lectures or read essays on particular subjects, are requested to send in, along with their announcement, a very short résumé of the contents of the same.

Correspondence in German language to be directed to Prof. Dr. Busch, chairman, Dorotheen Str., 40, Berlin ; in French language to Dr. Calais, Hohenbleichen 17, Hamburg ; in English to Prof. Dr. Miller, Voss Str. 32, Berlin.

In America, Drs. Barrett and Taft ; in Great Britain, Mr. J. H. Mummery, M. R. C. S., and Mr. W. Bowman Macleod, F. R. S. E., have, on invitation by the committee, expressed their willingness to act in the capacity of honorary presidents.

A fuller report of the steps taken in the organization of the congress up to the end of October, is given by Prof. Busch in the *Verhandlungen der Deutschen Odontologischen Gesellschaft, Heft 2*.

W. D. MILLER.

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## REVIEWS AND ABSTRACTS.

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### PAMPHLETS RECEIVED.

CONGRES INTERNATIONAL DENTAIRE. Tenu a Paris du 2, Au 7 Septembre, 1889.

MINISTERE DU COMMERCE, DE L'INDUSTRIE ET DES COLONIES.  
Exposition Universelle Internationale de Paris, 1889.

PROCES-VERBEAUX SOMMAIRES. Par M. Pourchet. Médecin de la Faculte de Paris, Professeur a L'Ecole, Dentaire de France, Secrétaire Général du Congrès.

PARIS IMPRIMERIE NATIONALE. MDCCCLXXXIX.

The industrious Secretary of the First International Dental Congress, having reported the labors of the Congress to the Minister of Commerce, the government has already issued the above résumé of the proceedings. Elsewhere we are publishing a translation of the work of the Congress, to which the reader is referred.

FIFTH ANNUAL REPORT OF THE BOARD OF DENTAL EXAMINERS OF THE STATE OF MINNESOTA, 1889. H. A. Knight, D. D. S., Secretary, Minneapolis. Below will be found the decision in full of the Supreme Court of the State of Minnesota, sustaining the Dental law of that State:

STATE OF MINNESOTA.—SUPREME COURT.

OCTOBER TERM, A. D., 1889.

State of Minnesota, *Respondent*, vs. Geert A. Vandersluis, *Appellant*.

Syllabus. Ch. 19, Laws 1889, entitled "An Act to regulate the practice of Dentistry in the State of Minnesota," is constitutional,—*Gilfillan, C. J.*

That the Legislature may prescribe such reasonable conditions upon the right to practice medicine or law as will exclude from the practice those who are unfitted for it, is so well settled by decisions of the courts as to be no longer an open question. The power rests on the right to protect the public against the injurious consequences likely to result from allowing persons to practice those professions who do not possess the special qualifications essential to enable the practitioner to practice the profession with safety to those who employ him. The same reasons apply with equal force to the profession of dentistry, which is but a branch of the medical profession. That in the exercise of that power the Legislature may require as a condition of the right to practice that the person shall purchase a license, may designate some officer or board to issue the license, and to determine whether an applicant possesses the qualifications required to entitle him to it, and may prescribe, so far as can be done by a special law, what qualifications shall be required, and how the possession of them by the applicant shall be ascertained, necessarily follows from the power itself.

It is for the Legislature and not for the courts to determine those things. The only limit to the legislative power to prescribe conditions to the right to practice in a profession, is that they shall be reasonable. Whether they are reasonable, that is whether the Legislature has gone beyond the proper limits of its power, the courts must judge. By the term reasonable we do not mean expedient, nor do we mean that the conditions must be such as the court would impose if it were called upon to prescribe what should be the conditions. They are to be deemed reasonable where, although perhaps not the wisest and best that might be adopted, they are fit and appropriate to the end in view, to-wit, the protection of the public, and are manifestly adopted in good faith for that purpose. If a condition

should be clearly arbitrary and capricious, if no reason, with reference to the end in view could be assigned for it, and especially if it appeared that it must have been adopted for some other purpose, such for instance as to favor or benefit some persons, or class of persons, it certainly would not be reasonable, and would be beyond the power of the Legislature to impose.

In 1885 the Legislature passed an act to regulate the practice of dentistry, Ch. 199, Laws 1885. This act continued in force until it was superseded and repealed by Ch. 19, Laws 1889. The latter act is assailed as unconstitutional. Though the act of 1885 is not called in question, we think it well to refer to some of its provisions: Sec. 1 made it unlawful for any person not at the passage of the act engaged in the practice of dentistry in the State, to commence such practice without a certificate as in the act provided. Section 5 provided for the certificate, which was to be issued by the board of examiners provided for in the act, upon a satisfactory examination. Section 4 made it the duty of every person at the time engaged in the practice of dentistry in the State, to within six months after the passage of the act, cause his name and residence or place of business to be registered with the board in a book to be kept by it for that purpose, provided that every person so registered is a practitioner of dentistry and might continue to practice as such.

Chapter 19, Laws 1889, section 1, provides that from and after September 1, 1889, it shall be unlawful for any person to practice dentistry in the State unless he shall first have obtained a certificate of registration and filed the same or a certified copy thereof with the Clerk of the District Court of the county of his residence, as in the act afterward provided. Sections 2 and 3 provide for a board of examiners. Section 4 makes it the duty of the board to transfer to a register to be kept by it for that purpose, within ten days after the second Tuesday in July, 1889, the name, residence and place of business of each and every person who on the second Wednesday in July, 1889, pursuant to the act of 1885, shall be qualified to practice dentistry in the State and who shall then be duly registered on the books of the board created by the act of 1885, and makes it the duty of the board to send to each of such persons a certificate of his registration.

It will be seen from these various provisions that those qualified to practice dentistry under the law of 1885 continued to be so qualified under the act of 1889, including both those who were in practice at the date of the former act and registered as it required, and those who became qualified by the examination and certificate provided by it.

SEC. 5 of the act of 1889, the provisions of which furnish one of the grounds on which appellant assails the act as unconstitutional, provides that any person who shall desire to begin the practice of dentistry in the State after Sept. 1, 1889, shall make application for examination to the board of examiners, paying a fee of ten dollars, and shall undergo an examination. The section further enacts "In order to be eligible for such examinations such person shall present to said board his diploma from some dental college in good standing and shall give satisfactory evidence of his right to the possession of the same; provided also that the board may in its discretion admit to examination such other persons as shall give satisfactory evidence of having been engaged in the practice of dentistry ten years prior to the date of the passage of this act. Said board shall have the power to determine the good standing of any college or colleges from which such diplomas



may have been granted." It then goes on to prescribe the manner, extent and subjects of the examinations.

What particular objections, of a constitutional character, the appellant makes to this section it is somewhat difficult to tell from his brief. We infer however that he claims the section to be objectionable because, no matter how well qualified by learning and skill or experience one may be, he has no absolute right to be examined by the board unless he has a diploma from a dental college in good standing, such good standing to be determined by the board, and this he claims to be a discrimination between the rich and poor, because one may be pecuniarily able and the other not able to attend a dental college. The mere fact of discrimination in such a law is no objection to it. Requiring a certain degree of learning and skill as a condition of being allowed to practice, is discrimination between those who have and those who have not that degree of learning and skill, between those who are able and those who are unable to acquire it.

If there were discriminations between persons or classes upon any matter not pertinent to the legitimate purpose of the law, to-wit: to secure fitness and competency in those who shall be permitted to practice, it would be objectionable. As for instance if it were as to place of birth, color or religious belief. The requirement of a diploma from some college or learned society in order to practice medicine has been inserted in the laws of many States and questioned in but few. In Massachusetts a law required the practitioner to have been licensed by the Medical Society, or been graduated a doctor in medicine at Harvard University. This was held constitutional in *Hewitt v. Charier*, 16 Pick. 356. The statute of Nevada (1875) required a medical education and a diploma from some regularly chartered medical school. This was held constitutional—*Ex parte spinney*, 10 Nev. 323. As the fact of having graduated at and received a diploma from a school or college devoting to teaching the particular science, medicine, surgery or dentistry bears directly upon the person's qualifications to practice, we have no doubt the legislature might have made that the sole test.

That this statute allows, in the discretion of the board, ten years' practice, prior to the passage of the act, as a substitute for the diploma of a college, furnishes no objections on constitutional grounds to the act. True it is asked why ten years' practice after the passage of the act ought not to entitle one to the same right as ten years' practice before its passage. A sufficient answer to this, is, that such practice after the act if in the State would be in violation of law, and the legislature surely may provide against inviting violations of the law, and for that purpose withhold all benefit from its violators.

It is objected that it is left to the discretion of the board to determine whether ten years' practice, instead of a diploma, shall admit one to examinations. On the score of expediency some questions might be made upon it. But as the Legislature might have left that provision out altogether, and made no exception to the requirement that an applicant for examination should have a diploma, we do not see that any questions can be made of the power to fix the period of ten years, nor of the power to leave it for the board to determine, in each particular case, whether the extent and character of the applicant's practice during the period has been such as to be equal as evidence of his qualifications to the possession of a diploma.

Sec. 7 reads: "All persons shall be said to be practicing dentistry within the meaning of this act who shall, for a fee or salary, or other reward, paid either to himself or to another person, for operations or parts of operations of any kind, treat diseases or lesions of the human teeth or jaws, or correct malpositions thereof. But nothing in this act contained shall be taken to apply to acts of *bona fide* students of dentistry, done in the pursuit of clinical advantages under the direct supervision of a preceptor or a licensed dentist in this State, during the period of their enrollment in a dental college and attendance upon a regular uninterrupted course in such college."

It is claimed that this shows the law to be an arbitrary measure for the benefit of dentists, by giving them a monopoly to practice a branch of surgery which has heretofore been largely carried on by regular physicians and surgeons.

It was proper, in order to give precision to the law, to define what was meant by practicing dentistry. It is not, however, to be supposed the Legislature intended to enlarge the sphere of the profession. There may be diseases of the jaws to and operations upon the jaws that are within the legitimate profession, both of the general surgeon and of the dentist. We do not know how this is. But if it be so, the licensed surgeon would be protected by his license in treating such. The act before us could hardly be so construed as to limit the right of the surgeon under his license.

It is claimed, also, that it discriminates between students of dentistry, by allowing them to operate upon the teeth and jaws during the period of their enrollment in a dental college and attendance upon a regular uninterrupted course in such college, and excluding others. The purpose of this provision of the law is apparent. It is to permit to actual *bona fide* students the benefit of practical work under an instructor. But to prevent evasions of the law by persons practicing the profession under the pretense of being students, the act very properly defines who shall be regarded as students within the clause allowing them to perform operations or parts of operations. It is open to every student to bring himself within the definition.

The interpretations of the clause under consideration, upon which appellant argues that it was intended to prefer schools of dentistry within the State, as against those out of it, is too narrow. We see no reason why a student in such a school in another State may not, during vacation, pursue his studies here under a licensed dentist, and be within the meaning of the clause. By "regular uninterrupted course," the act does not mean a course in which there are no vacations, such as all schools have. To hold that it does would lead to this unreasonable result: that the student, even in a school in this State, might, during the term, have the benefit of practice in operations under a licensed dentist, but would have to suspend as soon as the term should close.

The provisions and requirements of the law are undoubtedly rigorous. They ought to be in any law, aiming to protect the public against ignorance and incompetency in so important a profession as the medical profession in any of its branches. We see nothing in the provisions of this law that was not clearly inserted by the Legislature in good faith to effect the end in view. The law is valid. Judgment affirmed.

## MEMORANDA.

Dr. W. X. Sudduth was in Chicago recently.

Dr. A. Morsman has retired from the *Western Dental Journal*.

Dr. F. R. Ross, formerly of Cedar Rapids, Iowa, has located in Chicago.

Dr. Norman W. Kingsley has returned to New York fully restored to health.

If you use an appointment book, why don't you try Pearson's vest-pocket edition for 1890?

Section 14 of the International Medical Congress will be devoted to "Diseases of the Teeth."

The banquet of the First District Dental Society was well attended, and the speeches were excellent.

The Mississippi Valley Dental Society will meet in Cincinnati the first Wednesday in March, 1890.

Many friends have sent us "New Year's" cards with kind wishes, which we acknowledge with thanks and our best wishes for 1890.

The sympathies of the DENTAL REVIEW are extended to Dr. W. G. Stowell, of Chicago, who had the misfortune of losing a son, recently.

"La Grippe" has played sad havoc in the dental ranks, several dentists having succumbed in various portions of the United States and Canada.

Up to the time of going to press the World's Fair location had not been settled. The International Dental Congress idea, however, grows apace.

Dr. H. C. Wood has retired from the editorial management of the *Therapeutic Gazette*. Robert Meade Smith, M. D., will assume full control of the *Gazette* from January, 1890.

The Fiftieth Commencement of the Baltimore College of Dental Surgery will be held on Thursday, March 20th, 1890. All graduates and friends of the College are invited to be present.

Dr. T. L. Gilmer exhibited at the annual meeting of the Chicago Dental Society an electric root canal dryer. The same instrument may carry an electric lamp and galvano cautery.

A bill has been introduced in the South Dakota Legislature to amend the present Dental Law of the former Territory. If it is passed, we will point out the additions to it in a future number.

The Dental Protective Association received a great "boom" in New York. Many members were secured by the tireless president. Why do you hesitate? Send \$10 to Dr. J. N. Crouse, 2231 Prairie Ave., Chicago.

The American Dental Association will meet at Excelsior Springs, Mo., Tuesday, August 5, 1890. The officers having voted upon the proposition to change the date, eleven against and four indifferent—one only in favor of the change.

A short time ago Dr. Frank H. Gardiner reported a case of impaction of a temporary cuspid tooth in the ear that had given no trouble for *twenty-one years*. The possessor had thoughtlessly stored it in his ear when a lad of 11 years of age.



*Baltimore American:* Ohio, as usual, steps briskly to the front. Her latest products are babies born with teeth. Before long we shall probably hear of a few born with registration certificates and applications for office, all ready to be put on file.

Dr. J. W. Slonaker, formerly of Philadelphia, has located in Chicago, with the intention of devoting his entire time to the administration of anæsthetics and to the extraction of teeth. For many years an office of this character has been needed in Chicago.

Dr. B. H. Catching, the editor of the *Southern Dental Journal*, at Atlanta, Ga., has in course of preparation a *Compendium of Dental Science*, to be published at the close of the present year, and annually thereafter. We wish him much success in this venture, and we trust that the profession will be benefited by the publication.

Dr. W. W. Walker entertained the President of the First District Dental Society and Drs. J. W. White, L. D. Shepard, J. N. Crouse, H. J. McKellops, W. B. Ames, and the writer, at the Hotel Martin, Wednesday, January 15. There were no speeches, but the dinner was a success, and the stage ride to the Masonic Temple afterward was worth the price of admission.

New York is slowly accumulating money with which to hold the great international exposition. Any New Yorker will tell you that the fair will be here, and not in Chicago, from which it would seem that the people in your section are taking a great deal of trouble for nothing. We hear that you have nearly ten millions of dollars pledged. I heard a man suggest recently that a compromise be effected by which New York gets the fair, and Chicago holds the International Dental Congress. If New York does get the fair, this would be a channel into which those millions might be turned. Why not? With that sum you could invite us all, and send us complimentary return tickets.

R. O.

SANTA CRUZ DE YOJOA, HONDURAS, Central America, }  
 January 15, 1890. }

*Editor Dental Review:*

DEAR SIR—I use a solution of permanganate of potash (kali perm.) for disinfecting pulp canals. It has served me well. I fill canals carefully with gutta-percha.

I have not seen mention of the above in any periodical; however, it is possible that it is in general use. I do not think harm can possibly result even from abuse of the kali perm., while as a disinfectant it stands unrivaled. Should it touch the mucous membrane, there is no evil effect. Yours truly, O. A. RICE.

#### CHICAGO'S DENTAL CLUB.

At the annual meeting of the Chicago Dental Club, the following officers were elected: President, Dr. A. E. Matteson; vice-president, Dr. A. J. Nichols; secretary, Dr. C. Stoddard Smith; treasurer, Dr. E. M. S. Fernandez; member of the business committee, Dr. B. S. Palmer.

#### THE ITEMS OF INTEREST

When the "Items," with its new cover and pictures, etc., came to hand we were sadly shattered, and thought the "Hygeia" or the "Grippe" had us, but a little later came the following from an esteemed correspondent:

*To the Editor of the Dental Review:*

I received my Items of Interest a few days ago, and, by the way, I consider it a very nice Dental Journal, but the designs on the new cover of their January

number are too much for me, I think I have given it several hours of study, but still there are several *little* items of interest about it I fail to comprehend. Thinking you might aid me, I will ask a few questions in regard to it, not caring to expose my ignorance further from home than necessary :

- 1st. What dental chair is that over which the operator stands ?
- 2d. Where *did* he get that hat ?
- 3d. Why do they use such large kerosene lamps when the gas pipe penetrates the wall so conspicuously ?
- 4th. What do they use the pipe organ for, or is it a folding bed ?
- 5th. Who is the fine old gentleman with the genial countenance who has gone away and forgotten his head ?
- 6th. Why does the man bring the soup to the lady with the stoop ?

Respectfully, C.

[A few weeks in a sanitarium will cure our correspondent, but our case is hopeless. The future is a blank, until we see the old familiar cover !]

#### INVITATION TO THE TENTH INTERNATIONAL MEDICAL CONGRESS.

In accordance with the decision of the Ninth Congress at Washington, the Tenth International Medical Congress will be held at Berlin, from the fourth to the ninth of August, 1890.

By the delegates of the German medical faculties, and the chief medical societies of the German Empire, the undersigned have been appointed members of the General Committee of Organization. A Special Committee of Organization has also been appointed for each of the different sections, to arrange the scientific problems to be discussed at the meetings of the respective sections. An International Medical and Scientific Exhibition will also be held by the congress.

We have the honor to inform you of the above decisions, and at the same time cordially to invite your attendance at the congress. We should esteem it a favor if you would kindly extend this invitation to your friends in medical circles, as way may offer.

We beg to accompany our invitation by a copy of the Statutes and Programme, as also by the list of the intended sections and their special committees of organization. DR. RUDOLF VIRCHOW, President ; DR. VON BERGMANN, DR. LEYDEN, DR. WALDEYER, Vice-Presidents ; DR. LASSAR, Secretary-General.

All communications must be directed to the General Secretary, Berlin, NW., Karlstrasse 19.

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### OBITUARY.

The entire profession will learn with regret of the sad misfortunes of Dr. I. P. Wilson, of Burlington, Iowa. Last month his cup of sorrow was filled to overflowing. Within a week the light of two bright stars of his household was extinguished. Chester Lloyd and Hortense Wilson, respectively six and one and a half years old, were the victims of death. Scarcely had the family realized the second affliction when they were informed of the serious illness of a married daughter, Mrs. Minnie Todd, of Aberdeen, Dakota.

The REVIEW extends its sincerest sympathy to Dr. Wilson and his family, with the assurance that the entire profession unites with it in this expression of sorrow.

Drs. Wm. A. Pease, of Dayton, Ohio, Wm. M. Hunter and H. L. Moore, of Cincinnati, are deceased.

# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, MARCH 15, 1890.

No. 3.

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## ORIGINAL COMMUNICATIONS.

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### FERMENTATION AND PUTREFACTION.\*

BY G. V. BLACK, M. D., D. D. S., JACKSONVILLE, ILL.

Lately, my attention has been called to the use of the words Fermentation and Putrefaction, both by letters of inquiry from members of the profession, and my observation of their use in the journals. Without attempting to answer special inquiries or to notice cases of their wrong use in the journals, I will say that my observation of their use in our literature has shown that they are often used loosely on the one hand, and upon the other they are often made to mean something more than is justified by their usage by the best writers. In fact, they are often used to designate a certain state or quality of decomposition, when the context shows that the use of the words fail to designate the particular state or quality intended. It is perhaps impossible to so define the words as to make clear what their usage should be in all cases, especially if we take into consideration the various chemical processes involved in these changes. Indeed, nothing less than a close study of the various processes of decomposition will do this; and, furthermore, when this has been done, we must admit that from the chemical standpoint the words lose much of their seeming importance.

As a matter of fact, the use of the word putrefaction is founded on the odor of certain products of decomposition and does not represent a special form of decomposition more particularly. Though other differences have been found between the other fermentations and the putrefactions than that of bad smelling products,

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\* Read before the Odontological Society of Chicago, February 18, 1890.



the use of this word to represent them is not well founded. The recent discoveries of the connection of microbes with these processes has not changed the usage of the words.

Among the definitions at my command, Webster's are perhaps the best, as follows: Fermentation—"That change of organic substances, by which their starch, sugar, gluten, etc., under the influence of water, air and warmth, are decomposed, usually, with the evolution of gas and heat and their elements, are recombined in new compounds. The saccharine fermentation changes starch into sugar; the vinous converts sugar into alcohol; the acetous changes alcohol and other substances into vinegar; the viscous converts sugar into a mucilaginous substance; the putrefactive attends the decomposition of substances containing nitrogen."

Putrefaction—"The act or process of putrefying; the offensive decay of albuminoid compounds, accompanied by the presence of, and probably produced by, minute organisms."

Thomas (Medical Dictionary), in defining fermentation, says: "The spontaneous changes which animal or vegetable matters undergo when exposed to air and moisture at ordinary temperatures. The term is applied to various processes, among which are the vinous fermentation, which produces wine and alcohol; the saccharine, which produces sugar; the acetous, which produces vinegar; and the putrefactive, which is the decomposition of organic substances containing nitrogen into a fetid gas." He further states that the germ theory of these decompositions is now generally accepted. It will be seen that this is practically the same as the definitions given by Webster.

These definitions may leave us in a degree of uncertainty, but if we keep before the mind the scope of the definitions of fermentation we will see that there are many forms, and that putrefaction is one of them, in the latter of which, nitrogenized substances are decomposed; and in Webster's definition of putrefaction, we find it is the offensive decay of albuminoid compounds. All of the albuminoids are nitrogenized compounds. We may therefore state the case in this way; substances containing nitrogen are apt to give out foul odors during the process of fermentation, and in that case, the process is called putrefication, or putrefactive fermentation.

We might multiply definitions indefinitely without arriving at a better guide to the use of the terms. In this case it is better, perhaps, to turn our attention to the usage of the words by the best

writers on these subjects, and note their explanation of the processes. Liebig (Agricultural Chemistry, written in 1840 in English, and edited by Lyon Playfair who was at that time a student in his laboratory) says, page 90. "By the terms fermentation, putrefaction, and eremacausis (rotting), are meant, those changes in form and properties which compound organic substances undergo when separated from the organism, and exposed to the influence of water and a certain temperature. Fermentation and putrefaction are examples of that kind of decomposition which we have named transformations. The elements of the bodies capable of undergoing these changes arrange themselves into new combinations, in which the constituents of water generally take a part."

"Eremacausis, or decay, differs from fermentation or putrefaction inasmuch as it cannot take place without the access of air, the oxygen of which is absorbed by the decaying bodies. Hence it is a process of slow combustion, in which heat is uniformly evolved, and, occasionally, even light. In the processes of decomposition termed fermentation and putrefaction gaseous products are very frequently formed, which are either inodorous, or possess a very offensive smell."

"The transformation of those matters which evolve gaseous products *without odor* are now, by pretty general consent, designated by the term fermentation; while to the spontaneous decomposition of bodies which emit gases of a *disagreeable smell* (the italics are mine) the term putrefaction is applied. But the smell is, of course, no distinctive character of the decomposition, for both fermentation and putrefaction are processes of a similar kind, the one of substances destitute of nitrogen, and the other of substances which contain it."

"It has also been customary to distinguish from fermentation and putrefaction a particular class of transformations, viz., those in which conversions and transpositions are effected without the evolution of gaseous products. But the conditions under which the products of decomposition present themselves are purely accidental; there is, therefore, no reason for the distinction just mentioned."

Fluegge (1886), who is one of the best representatives of the germ theory of the decompositions, defines putrefaction (Die Fäulniss) on page 493, which definition I translate as follows: "We designate by the terms putrefaction, or putrefactive fermentation,

the rapid and intense decomposition of nitrogenized, especially albuminoid substances by certain microbes, during which bad smelling products in large amounts are produced." His definition of fermentation (page 475) is combined with the germ theory of its causation so intricately and at such length as not to be available here; but, when divested of this, it is in no wise different from the definitions already given. He says (page 476), "We distinguish a large number of specific fermentations which are sometimes named after one or more of the characteristic products, after the fermenting material, or finally after the particular microbe which causes the fermentation. In the following (his description of the processes) the fermentation by the yeast fungus (*Hefepilze*) is first described, and afterward the various fermentations by the fission fungi; (*Spaltpilze*) which latter are divided into five groups, as follows: *a*, Fermentation of the carbo-hydrates; *b*, fermentation of the richer alcohols, glycerine, erythrite, mannite; *c*, fermentation of the fatty acids; *d*, putrefaction; *e*, the formation of acetic acid from alcohol."

Among the books in my library by writers of reputation and authority, I will refer to the following whose usage substantially sustain the usage and definitions above stated.

De Bary. Lectures on bacteria; 1887; page 103.

De Bary. Morphology and biology of the fungi; 1887.

Magnin. Translated by Sternberg; 1880; page 136.

Magnin-Sternberg. Bacteria; 1884.

Schutzenberger. Fermentation; 1876; page 215.

Hueppe. Translated by Biggs. Methods of bacteriological investigations; 1886; page 9.

Hueppe. Revised German edition; 1889.

Liebig. Chemische Briefe; 1878.

Chamber's Encyclopedia, under the heads of fermentation and putrefaction.

After a pretty careful review of the works mentioned, it seems to me that the usage of these words justifies the designation of the processes of rapid decomposition by the term "fermentation," and that the term "putrefaction" should be limited to examples of these decompositions in which bad-smelling, gaseous products are liberated. In other words, when, after the examination of a given case a man says it is putrefaction, we should always suppose that he has met with bad-smelling products.



Most of the writers referred to make use of the word "decomposition," much more frequently than they use the words "fermentation" or "putrefaction;" and in the main it is a much better word for us to use to designate the chemical changes taking place in a patient's mouth, or in out-of-the-way places about the teeth. If, however, it be clearly a process of putrefaction that has been met with, it is the correct thing to say so. The use of the word "decomposition" has the merit of designating the fact that chemical changes are in progress without carrying with that statement any expression as to the character or quality of those changes. It is therefore much the better word to use when the character or quality of the chemical changes are unknown.

There is much reason for grouping these processes under several heads, as has already been attempted by some, among which fermentation and putrefaction should stand as somewhat general terms. At present, however, the more careful observers agree that the lines cannot be well drawn for the want of more accurate knowledge of the character of the processes. All agree that these decompositions are brought about by a similar cause. No writer whom I have read is more pronounced in this opinion, or has expressed it more forcibly than Liebig has done in his articles in opposition to the germ theory. He included not only the ordinary decompositions, but also the miasmatic and contagious diseases as well, and claimed a similar cause for them all. A cause that, while similar, had certain distinct differences which gave rise to different results.

There has been a growing disposition to draw lines of distinction between these decompositions, but none have as yet stood the test. The most rational classification may be briefly designated as:

Fermentation by the soluble ferments, or digestion.

Specific fermentations, or the true fermentations.

Putrefaction, or fermentation with bad-smelling gaseous products.

Decay, or fermentation in which direct oxidation plays an important part.

The fermentation by soluble ferments is now pretty accurately known, though its limitations in connection with the other fermentations, cannot yet be quite fully stated. One of its most distinctive types is the conversion of starch into sugar by the ptyalin of the saliva. This so-called form of fermentation is what is otherwise

known as digestion in the animal kingdom, and that function of the minute organism which prepares the food material for absorption; or for the further changes which it is destined to undergo in the act of fermentation. This ferment material may be separated from the plants, in most cases, as pepsin (which is one of the soluble ferments) is separated from the stomach of the pig, and will produce its effects when redissolved.

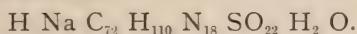
The specific fermentations are those which produce products of a specific kind, as alcohol, lactic acid, butyric acid, etc. They all require sugar or some allied compound for their development. The number of substances capable of this kind of fermentation is pretty large, larger than one might suppose at first thought, and includes substances very different in appearance. But in all of them the construction of the molecule is similar, and they are convertible into some of the forms of sugar.

Nearly all, if not all, of these fermentations, progress better with exclusion, or partial exclusion, of the oxygen of the air, as in the depth of liquids, though they may occur to a more limited extent with free access of oxygen. It is characteristic of these that the elements of the molecules of the fermenting substances rearrange themselves into one or two, generally two, principal new compounds, as carbonic acid and alcohol. With this, the decomposition is apt to cease.

Putrefaction differs from the specific fermentations in that stinking gases are formed. This rests on certain chemical differences which are purely accidental and belong to the substances acted upon, on the one hand, and the capabilities of the exciter or exciters of the decomposition, upon the other. For this form of decomposition the substances must contain nitrogen or sulphur, or both, for the very simple reason that one of these must be a component of a gas that stinks. Possibly phosphorus might be included, but in nature it does not figure largely. But there is another difference that is more important, if possible, in the chemical way, and that is the construction of the molecule of the decomposing substance.

While the molecule of sugar is composed of ( $C_6 H_{12} O_6$ ) twenty-four atoms of the simple elements, the molecule of the albuminoids and other nitrogenous compounds is far more complex. No trustworthy formulæ have yet been made out, but Gerhardt's formula for albumen is quoted by some (see Atwood's Chemistry, 1883,

page 456) as furnishing an approximation to the construction of its molecule ; this is as follows :



which gives three hundred and ninety-one simple atoms. Now, when the equilibrium of the less complex molecule of sugar is disturbed it readily falls into one, two or more distinct molecular forms ; but the molecule of albumen, under similar circumstances, falls into a large number of different groupings, forming as many different substances. As might be expected from the breaking up of so complex a molecule, very different substances are likely to be formed under different conditions ; as to warmth, as to moisture, as to access of air, etc. Therefore the products are inconstant. These, again, may undergo a further splitting by the fermentative process. (Fluegge, page 593-4.) Furthermore the whole matter is rendered still more complex by the reactions of the compounds formed upon each other, and the formation of still others. Finally, many of these probably become oxidized when they gain access to the air.

It will be seen that an analysis of the molecular changes that occur in the decomposition of nitrogenized organic substances is exceedingly difficult to follow. Quite a large number of products have been made out (see Fluegge, page 494-5) but there is still only a very imperfect idea gained of the manner of the molecular movements, and molecular groupings.

Putrefactive fermentation, like the specific fermentations, requires for its most rapid progress the presence of moisture, and the exclusion, partial, or complete, of oxygen. The decomposition is much changed in character by the free access of air. However, the outer part, as the skin of an animal, or even the outer part of any considerable piece of flesh, is a sufficient protection to that within to allow the process full development.

It must not be supposed, however, that every decomposition taking place in compounds containing nitrogen must be putrefactive. These compounds may be changed, or suffer forms of decomposition, without the formation of offensive gases. Furthermore, nitrogenized compounds may contain various forms of carbo-hydrates in solution ; and these may undergo one or the other of the specific fermentations without any considerable decomposition of the nitrogenized molecules. The saliva, for instance, almost always contains some form of sugar, either from its direct introduction into



the mouth, or from the conversion of other carbo-hydrates, as starch, by the ptyalin of the saliva; and this may ferment without involving the decomposition of the nitrogenized molecules further than that necessary to the formation of the protoplasm of the growing plants. This amount seems to be very small; but without it, even the yeast plant cannot long continue to thrive.

Under the designation of decay, or fermentation largely by oxidation, there is a very large number of decompositions that have not yet been studied, and of which very little is known. They include the decay, in the open air, of fruits, of woods, small quantities of flesh, &c.

These are all, or nearly all, brought about by microbes; but the compounds formed are at once changed by oxidation. Therefore, there is no smell accompanying them. Many of these decompositions are, when of nitrogenized bodies, closely allied to the putrefactions. Indeed the one may be in progress on the surface of a piece of flesh, and the other in the interior; the difference being due entirely to the influence of the air by which the products from the surface decomposition are oxidized as fast as formed. (Fluegge, page 499.) Again many of them are closely allied to the specific fermentations; the whole difference being due to the free access of the air. Still again, there are undoubtedly many others that differ from either, of which acetic fermentation is an example. It is well known that a solution of alcohol, when spread in thin layers to the air, as by percolation through shavings or twigs, through which there is at the same time a free circulation of air, may be changed to water and acetic acid by oxidation, without the intervention of germs. It is also effected by germs; but only when there is oxygen present, probably. At least it is generally claimed that the total exclusion of oxygen prevents the acetic fermentation. This fact separates it sharply from the so called specific fermentations. It is, on this account, placed in a class by itself by some of the later writers. The decomposition by germs is different from that produced artificially by oxidation, in that a notable quantity of carbon dioxide is given off.

The destructive effect of this form of fermentation, when combined with others, is thus spoken of by De Bary: (Lectures on Bacteria, page 70.) "Alcoholic fermentation, for example, is excited in saccharine solutions by several species of *saccharomyces*, and also by several species of the group of *mucorini*. The same

species can also set up different decompositions in different substrata. The vinegar bacterium oxidizes the alcohol in dilute solutions, and converts it into acetic acid, and this into carbonic acid and water when the alcohol is exhausted." In this way the organic substance is returned to the simplest elementary compounds possible, by the process of fermentation, without putrefaction being present at any time.

If, however, at the close of the processes just detailed there should be a residue of nitrogenous material sufficient for the exclusion of air from its mass, putrefaction would occur. If the residue is not sufficient for this, it decomposes by the process of decay.

I should, perhaps, mention a theory of fermentation that seems to be gaining ground of late with some of our best thinkers on this subject. I do not know of any concise explanation of it in the English language, but will give a statement of it from a paragraph from Fluegge, page 508. The theory which I have given in the little book, "*Formation of Poisons by Micro-organisms*," is now, perhaps, the most generally adopted, viz., that the products of fermentation are the waste products of the micro-organisms.

To many this is not satisfactory, as applied to the specific fermentations, on account of the large quantities of these products. Pasteur, who opposes this idea, has recently asserted that not more than 1 per cent of the products of alcoholic fermentation could possibly be waste products of the organisms. The theory—and it can only be regarded as a theory—is accorded to Nagelli, and must, it seems to me, be regarded as Liebig's dynamic theory transferred to micro-organisms. Fluegge says of it, that it is not as yet at all proven; but that, "taken all in all, Nagelli's view of the act of fermentation seems to be the best supported by the facts now at our command, and is therefore the most plausible hypothesis." According to this, the excitation to fermentation is developed by the intra-molecular activity of the protoplasm of the cells in the form of an intense vibration. In the fluid, and in the immediate neighborhood, but outside of the chemical molecule of the protoplasm, there are present other chemical molecules which, through this vibration are brought into similar vibration (vibration in unison) by which they are decomposed. Those organisms whose protoplasm is not capable of producing a similar, or sufficient vibration, are not capable of producing fermentation. Only such substances are susceptible of fermentation as have molecules which

are readily brought into vibration in unison with the protoplasm of certain micro-organisms.

It seems to me that if this view of the act of fermentation should be adopted, we are likely to have great changes in our notions of some of the processes of decomposition in the near future. It is freely suggested that in many of the decompositions we have only the waste products of the micro-organisms, changed in many instances by oxidation. In fact, that in the one case the substance is merely eaten up, and in the other it is decomposed; much of it without being at any time an integral portion of the living cell. This would form a wide distinction between decay and fermentation. Putrefaction would still belong to the fermentations, but decay—at least many of its forms—would be removed from this category.

Some new ideas have recently been developed through experiments with the culture of microbes in fresh normal animal juices which are of especial interest with reference to the predisposing causes of those diseases of which micro-organisms are the excitors; and which are of especial interest to us in their relation to dental caries. In the "American System of Dentistry," Vol. I, page 774, I have called attention to the changes in the qualities of the saliva, and hereditary differences in this fluid as regards its susceptibility to fermentation; and I have often called attention to the fact that many forms of micro-organisms failed to grow in human saliva. Subjects so closely akin to this as to lie in the same field have come up for exact experiment recently, and the attention of some very excellent observers is turned to it.

Important discoveries have already been made, and we may reasonably expect others in the near future. Dr. T. Mitchell Prudden, Director of the Laboratory, College of Physicians and Surgeons, New York, has recently (*Medical Record*, Jan. 25, 1890) given us an excerpt of the experiments thus far made by Nuttall, Buchner, Nissen and Lubarsch, with additional experiments of his own. From these experiments it is shown that the normal body fluids, and especially fresh blood serum, have the power of destroying various species of bacteria when placed in them. This power is surprisingly different for different microbes. For instance, the bacillus of typhoid fever was almost totally destroyed by fresh hydrocele fluid within twenty-four hours, while staphylococcus pyogenes aureus was but little affected (Prudden's experiments). For other



species the sum total of the experiments shows the killing power of these fluids to be very variable.

Again, the effect of the blood serum of different animals varies very materially in its microbe-killing power. While certain pathogenic bacteria were little affected by the blood serum of the rabbit, they were rapidly killed by the blood serum of the dog, etc. (Buchner's experiments.)

This property belongs to the fresh serum only, but under favorable conditions, remains active for one or two days, showing progressive weakening until lost. It then becomes good bacterial food for the same species which it destroyed at first. This property is at once destroyed by boiling, and the serum becomes good bacterial food. It also seems almost certain, from experiments by Buchner, that it is destroyed by freezing.

Of the body fluids experimented with, the blood serum is probably the most active disinfectant, while others act in lesser degrees, and some are not disinfectant at all. At least Dr. Prudden found that the typhoid bacillus multiplied rapidly in the fresh liquor amnii of the pig.

What is this property? Is it some form of motion communicated to the fluid by its contact with the life principle, or does it depend upon the molecular constitution of the fluid? We know that sunlight, a form of motion, has a wonderful effect in the formation of the chlorophyl of plants and various other physiological acts of plant life. Indeed, there are many circumstances which seem to point to some form of motion or dynamic force, communicated by life to the fluid matters within its realm. This has given rise to Nagelli's hypothesis of the fermentations, and until something more plausible be found, it may afford a thinkable hypothesis in this new field of research.

This field promises more for the dentists of the future than any other that has recently been opened, for it proposes to explain the reasons for the differences of the susceptibility of individuals to caries of the teeth. From this, it will be but another step to the control of these susceptibilities.

Passing now from the theories of the decompositions, and those subtle, and so often occult influences which may favor, prohibit, or modify the growth of the microbes, the agents which produce them, back to the use of words, it will be seen that there must as yet be much transpiring in the mouths of our patients that we do

not well understand and cannot describe. Under these conditions we should avoid the use of words which give direct opinions as to the kind or quality of decompositions, when that kind or quality is not clearly apparent. In other words, the term decomposition will oftener express our idea correctly than fermentation or putrefaction. We are continually meeting with examples of these decompositions in the mouths of our patients, and they are presented in all manner of forms. In every cavity in a tooth, and especially in every pulp chamber that is open to the fluids of the mouth, the pulp being dead, processes of decomposition are in progress. These may be fermentation of a specific kind with the formation of an acid, such as the lactic; or may be true putrefactions with the formation of bad smelling products; or they may be neither. Whatever they are to-day, they may be something else to-morrow, or next week. There are many forms of micro-organisms habitually in the mouth, and new forms may be acquired from the air at any time; and, if they are able to grow in the saliva, or in the debris lodged in out of-the-way-places, the development of colonies is assured. Therefore if grave mischief is not in actual progress in these places which afford them shelter, mischief may occur at any time. Varieties which produce grave poisons may find lodgment and be ready to invade the tissues whenever a solution of continuity gives the opportunity. Many a distressing and painful sore following the extraction of teeth occurs from this cause, which might be avoided by an appreciation of the cause which would lead the operator to thoroughly clean the parts with tepid water, followed by an antiseptic, before operating.

The fact that so large a part of the ills to which the teeth are liable is the direct result of acid fermentation in the pits, fissures, interproximate spaces, and other secluded points in contact with the teeth, should of itself stimulate dentists to the closest study of decompositions. There is no class of professional men who are brought in such intimate daily contact with disease brought about exclusively in this manner, or who have to deal with the results of decomposition so continuously as dentists. And even where facts are as yet beyond reach, they should be well versed in the theories that are afloat; for from these strivings for the truth, truth will eventually come.

## CRYSTALLOID GOLD.

BY C. N. JOHNSON, L. D. S., D. D. S., CHICAGO, ILL.

Various forms of so-called plastic or sponge gold have from time to time been offered to the profession, but none of them has come into general use. A partial reason for this is the peculiar nature of the material which calls for peculiar methods of manipulation not easily grasped by the ordinary operator. But probably the greatest drawback to its use by those who have studied it most, is its tendency to become granular on the slightest mismanagement.

An equal rapidity in manipulation would entail a greater waste of plastic gold than of foil or pellets. In short, plastic gold has not tenacity of fiber enough to make it work conveniently as a filling material.

But it has two desirable qualities which should not be lost sight of. It is more readily adapted to the walls of cavities, owing to the ease with which its particles—not being fibrous—will slide over each other and spread under pressure. Then again, the same characteristic conduces to an even surface on the filling, which is not always so readily obtained with ordinary foil. It is doubtful if fillings made from plastic gold have the strength—would stand an equal strain if built into contours—that have those from a more fibrous material, but the report of operators who have had long experience with it, seem to favor the conclusion that a better surface will be retained after years of wear than with any other form of gold.

To overcome the disadvantage of plastic gold and at the same time retain its desirable qualities, Mr. R. S. Williams, of New York, hit upon the idea of enclosing between two sheets of foil, a layer of plastic gold. The foil is exceedingly thin so it does not materially interfere with the plasticity of the material under the plugger, and yet it imparts to the mass a sufficient degree of toughness to make it work kindly.

It comes in four numbers. Nos. 1 and 2 are recommended for starting fillings; No. 3 for general and contour work, and No. 4 for use in connection with amalgam, where the latter has been placed along the cervical margin of deep cavities.

The writer has had no experience with No. 4, and very little with No. 3; but for starting fillings Nos. 1 and 2 come nearer being



the ideal filling material than anything that has ever been offered the profession.

If it is not used in every office where gold fillings are inserted, it is because its good qualities are not recognized, or its proper manipulation not understood. From reports concerning its use it is feared that few operators handle this gold properly. It should never be used in flat pieces cut from the pads as we get them from the manufacturer. The layers of foil on the outside are so thin that used in this form they are liable to be punctured or torn, when immediately we have the same difficulty as with ordinary plastic gold—a crumbling of the material which makes it very unsatisfactory. One or two experiences of this kind are enough to discourage the operator, and it has too often been thrown aside without realizing that the fault was in the manner of working instead of in the material.

To properly start a filling with crystalloid gold one should note the kind of cavity to be filled and prepare the gold accordingly. If a small, round, "well-shaped" cavity—often the most difficult in which to secure a firm foundation—a strip should be cut from the gold somewhat wider than the depth of the cavity. This should then be rolled quite tight until the pellet is so large that—standing on its end—it will fit snugly into the cavity. A plugger with point nearly as broad as the area of the cavity, and having shallow serrations, should then be used and the whole mass driven into place with hand pressure. If used in this way the gold will in every instance stay firmly impacted in the bottom of the cavity and will not roll or tilt when other gold is added to it. An ordinary crown cavity in a molar or bicuspid—especially the upper—is more than half filled by this one pellet, and with the assurance that adaptation is good if the force is properly applied.

Tests made out of the mouth show that crystalloid gold under pressure will conform to surfaces which are very uneven, and the firmness with which it is anchored in the bottom of an ordinary cavity proves that it must fit the walls accurately.

If the cavity is a proximal one in a molar or bicuspid, the strip should be cut sufficiently wide to reach across the floor of the cavity from buccal to lingual wall. It should then be rolled large enough so that when laid lengthways in position it will cover well the cervical margin, and admit of being wedged firmly into place with broad pointed pluggers. Pressure should first be directed on

one end of the pellet toward the cervico-buccal, or cervico-lingual corner, and then—though this is not always necessary—that end may be held firm with an instrument in the left hand, while the other is driven into place in the opposite corner.

There is not the same tendency for this gold to curl up after being condensed as with other forms, and if enough material is used to cover well the bottom of the cavity, and a broad plugger which will carry the mass before it instead of puncturing it, the feat of starting a filling in almost any cavity is rendered extremely simple.

This certainly cannot be said of ordinary gold, for although non-cohesive gold has been advocated for this purpose as being all that was desired, the fact is that we have found a large discrepancy between the theory and the practice. Non-cohesive gold will not in all cases stay where it is placed, and while much preferable to cohesive in this respect, it cannot be compared with crystalloid.

The main point then in starting a filling with crystalloid is to roll it carefully into pellets of proper size, which lessens the tendency to crumble. When rolled in this way it makes a tough, putty-like mass, which when manipulated with broad pluggers will prove a great comfort to those who have had difficulty in making the first portion of a filling firm.

The convenience of having pellets on hand has led the writer to roll up a variety of sizes during spare moments, thus saving time at the chair.

Of course the gold should never be annealed for starting the filling, but if No. 3 be used for completing the operation it requires annealing to a red heat.

As has been intimated, the writer's experience with the latter has been too limited to express an opinion. His preference yet is for the ordinary foil or pellets in the bulk of the filling, but for finishing the No. 3 crystalloid laid flat instead of rolled into pellets, and firmly malleted, makes a much more even surface than ordinary foil; and if time proves it to wear well it certainly will be preferable for this purpose.

To those who have not used crystalloid, the advice is to give it a careful trial, and the hope is expressed that it will prove as great a satisfaction to others as it has to the writer.

## THE OLD AND NEW IN DENTISTRY.\*

BY DR. C. W. COX, BATAVIA, ILL.

It is quite probable that a number of dentists of Northern Illinois have heard Col. Sanford, the celebrated traveler and lecturer, deliver his lecture, entitled "The Old and the New." He introduces his subject by telling of an old house in Davenport, Iowa, (Davenport was the home of his boyhood), which was said to be fifty years old.

He tells how he loved to wander out to this old house, and awed by its (to him) great antiquity, gaze at it and ponder upon its great age, and how many changes had taken place in the world, and in the town, since that old house was built.

He would wonder what scenes had taken place within its old walls, what happy times, and what sad. Of the births and deaths.

It *was* an old house; the oldest he had ever seen. But one day he left Davenport, (and by the way he said the neighbors were all glad to have him go) and went to New York City. There he saw houses said to be two hundred and three hundred years old.

The old house in Davenport, when compared to these houses, seemed young. When he reached manhood's estate he went to London and there saw many old buildings, among them Westminster Abbey, a part of which dates back to the seventh century. The houses in New York, compared to this old pile, appeared of recent date, while the old house in Davenport seemed hardly old at all. But during his many travels he saw many old houses, ruins, temples, Pompeii.

The Colosseum at Rome—Pyramids of Egypt, etc., etc., compared with which Westminster itself appeared youthful, the houses in New York as infants and the house in Davenport as if built a moment ago. He then said, "things are old or new as we look at them or as in comparison with things older or newer." A young lady, eighteen years of age, he said, was not a bad subject to contemplate, and did not bring to mind things worn and aged, nor does antiquity enter the mind while gazing upon such an object. But when you speak of a spring chicken eighteen years of age—well, that is different. Dentistry, as compared to other professions, such as law and medicine, is extremely young and is even more doubting

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\*Read before the Northern Illinois Dental Society, October, 1889.



in its own mind whether it is a profession or not. I know some will now think: Oh, that is a mistake, dentistry was practiced thousands of years ago. Have we not knowledge of teeth having been filled with gold even at that early period? Have not mummies been exhumed who had teeth filled with gold? Yes, I know we read of such things and no doubt they are true, and according to the word "dentistry," as defined by Harris, Adam himself may have practiced the art. He defines it thus: "Dentistry, dental surgery, embracing everything pertaining to the treatment and replacement of the loss of the natural teeth." And might it not be possible that Adam bit a piece of the cold apple into the posterior approximal cavity of a first superior right bicuspid, thereby causing a severe paroxysm of pain. Might he not have removed the cold apple from the tooth, using a thorn as an excavator, and have filled the cavity temporarily with pulverized fig leaves?

This would have constituted a dental operation, and could very properly perhaps be called practicing dentistry. But when we speak of dentistry to-day, we mean something vastly different from this. If the art of dentistry, with modes of operating or with results *from* operating on the teeth, existed three or four thousand years ago, that could not compare at all with the modes of operating, or the results from operating on the teeth to-day. That art became a lost art, and we have no knowledge of its existence in a much less crude form than Adam may have practiced it until within recent times. I know that here and there in times remote and distant, medical writers have mentioned the fact that teeth composed a part of the anatomy of mankind. But I imagine they passed the subject hastily by then, even as most medical writers do now.

Little was known of the anatomy of the teeth themselves until the year 1771, when John Hunter wrote his first treatise on the teeth.

In 1778 the same writer wrote his second treatise on the same subject, and on this the English school of dentistry was founded. But John Hunter himself, although an eminent anatomist, was not a dentist. And I presume he could not have treated with any degree of success a common alveolar abscess with a fistulous opening.

It is plain to see that dentistry originally sprung from the medical profession, but to dentists and not to physicians is due its progress.

When we read and remember that Mr. John Greenwood was the first native dentist of America, and that he commenced his practice in New York city in the year 1778, and was the only dentist in that city in the year 1790, less than 100 years ago, and when we remember that not until the year 1805, in the city of Philadelphia, the center of dental schools and the great source of dental goods, was there a dentist. I say again the profession of dentistry as we understand it, when compared to other professions, is extremely young. I would not really call it a spring chicken, for I think it too old for that. I think it can more fitly be illustrated by Col. Sanford's young lady of 18 years—like her fair and also fickle, as she no doubt was—accepting some new lover to-day, whom to-morrow she discards.

So dentistry receives with open arms some new lover to-day, in the form of some new medicine or new dental operation; sings his praises far and wide; tells of his wonderful achievements and how he is the all in all, and to-morrow discards him with a frown so stern that his banishment seems only the blacker for the light he has seen. These new fancies I think could be better illustrated by the Col.'s spring chicken. But if some gentlemen here considers this term too common and unclean to be applied in the manner we are about to use it, take no offense, I pray, remembering the logic of Romeo holds good to-day—"The rose by any other name," etc. And in the matter of such new fancies, I think dentistry can successfully compete with any young maiden of eighteen, and (speaking scientifically) give her odds, the young maiden in a few more years will have developed into a noble woman with a well-rounded personality, with convictions firm and sure, discriminating surely whom to love and whom to pass by. Not quite so beautiful to look upon perhaps as when but 18, but much more beautiful in character and possessed of a knowledge taught by experience. She now has definite aims and ambitions and definite roads to reach the same. Although she has cut loose from her mother, her mother does not disown her, but is more proud of her than ever before and loves to let it be known she is her child.

So dentistry, when years have gone, will have cut loose from her not-over solicitous mother, the medical profession, and will have developed such a well-rounded individuality, will have accomplished such great things, will have such definite aims and purposes and such definite systems for reaching the same, that she

will no longer be striving to prove her parentage. And then *her* mother will proudly say: "Oh, this is *dentistry*; *SHE* is *my* child." And I expect dentistry will cause the old lady much happiness by showing her that her brilliant and progressive daughter is not really ashamed of her old-fashioned and old-fogyish mother.

Let us now look back and note some of the chickens dentistry has owned. I hardly think dentistry could have been compared to a young lady 35 or 40 years ago. Young ladies are generally beautiful, clean and sweet, and dentistry must have been anything else at that date. Dentists had no rubber dam then, and when nothing but napkins were used to keep the saliva from the teeth, practicing dentistry must have been some thing else than clean or sweet when prolonged operations were performed.

What a difference that little piece of rubber makes. It changes prolonged dental operations from something nauseating and disgusting, to something clean, neat and pleasurable. And when we think that there are probably several dentists in this room who practiced dentistry long before Dr. Barnum almost blushingly gave the profession his piece of rubber cloth, it shows again how youthful the practice of dentistry, as we know it, really is.

I think dentistry as practiced thirty-five or forty years ago could be better likened to a half-grown boy, and I see that Dr. Townsend in his address before the American Society of Dental Surgeons, held in Cincinnati May 8, 1855, uses that very illustration, and with your permission I will quote a few passages from that fine address, as they show strikingly not only how dentistry, but also how this country has advanced since that short time ago. He begins his address by saying, "It is now fifteen years since the American Society of Dental Surgeons was organized, yet this is the first time that its members have assembled west of the Alleghany mountains. The Atlantic slope has been heretofore most happy to extend its professional hospitality to the Mississippi Valley, and now at last it has the pleasure of enjoying the exchange of brotherly courtesy. The reasons for this reciprocity have existed and have been felt and acknowledged long before the inconvenience of compliance could be overcome, but I think I may speak with the clearest assurance for my brethren of the east, that they have found a new happiness in thus meeting and greeting their friends of the West in their own home." This paper I said was read in Cincinnati. Note how far west the good doctor thought he had got, and its being so difficult



to get there was the reason he and his brothers had never been there before. He then says in another paragraph. "I will not undertake to settle the west longitude of Cincinnati from the site of the professional observatory, but however far it was behind time in the morning of our day, it seems to me that its meridian has rolled itself fairly into the noontide, and that the whole difference in time is lost in the equality of light in which it now stands, I see nothing of the shadow of the Alleghany upon the science of the great valley, nor do the rays of your sun seem to slant any more than they do down east." Down East, indeed!

That is about where we dentists of Illinois consider Cincinnati to-day. The doctor proceeds: "Fifteen years ago there were 1,200 practitioners of dentistry in the Union. The United States census of 1850 reports 2,923, and the five years since elapsed have added perhaps 200 annually; bringing the number up to 4,000, one dentist for every 6,000 of the population of the Union. In 1840 there was but one dentist to every 15,000 of the inhabitants. But this numerical increase of three to one must be multiplied three times at least, to render fairly the amount of the demand for the services of the profession.

By this estimate, dentistry has risen at least nine fold in public and popular requirement and consideration during the little life time of this society.' According to the doctor's figures the population of the country in 1855 was 24,000,000. How youthful indeed is dentistry and how youthful indeed is the country in which we live. The doctor then says:—"If the analogy to a human life might be borrowed, we would be justified in saying that our profession had only worried through into infancy.

Since then its growth in all things has been that upon which the boy enters at the period of his puberty, a period of manhood in all its faculties and functions, wanting only the discipline of time and experience to strengthen his energies." I think this boy was a good illustration of dentistry then.

Boys at the age of puberty are not apt to be over nice and clean and not too dainty, but now dentistry is a nice, clean business, and I simply change the sex, and I think that a good illustration to-day. But now in regard to the demand for dental services.

According to Dr. Townsend's paper there were 4,000 dentists and 24,000,000 people in this country in 1855. Now we have at least 25,000 dentists and 60,000,000 inhabitants—or one dentist to

every 2,400 of the population—and I believe the average dentist to-day enjoys a more remunerative practice than did the average dentist of 1855, and also a more remunerative practice than the average dentist of 1840 when there was but one dentist to every 15,000 inhabitants. Now why this great increase in the demand for dental services?

Do teeth decay more now than then? I think not. There have been many causes to bring about this result. Dentistry has received its impetus in a progressive age and in a progressive country. Other things have progressed as well.

Great men with scholarly minds and dextrous hands have stood at the head of dentistry and like the cloud by day, and the pillar of fire by night, have guided it through the wilderness. But among the many causes which have aided it in its progress, there is one cause I believe to be the peer of any. And although firm in my convictions I hardly dare name this great cause and it is with fear and trembling that I do so, for it is nothing more nor less \*than amalgam. But I do hate a man who will not stand up for his friends. And when I have attended dental associations and have heard amalgam abused, have heard it called bad names, have even heard it called murderer, I have gone home and hated myself that I would sit and hear one of my best friends so slandered and say no word in his defense, for I believed then as I do now, that amalgam was one of the chief causes for the rapid progress dentistry has made. It brought it within the reach of the masses.

They could not afford to have the large cavities in their molars filled with gold, but they could afford to have them filled with amalgam, and when they found their teeth were saved they believed in it. And, gentlemen, when you get the masses of this great country to believe in a certain thing, that thing has a future before it in spite of all else. Amalgam was a spring chicken in 1855, and a sorrier lot never a chicken had. The hen who hatched it was ashamed to own it—and a very common barn-yard hen it was at that.

She forsook it as soon as it was hatched, and chickens who were hatched at the same time drove it from the roost, and big dentists hurled their fiercest darts at its defenseless head, and when they did not down it, they loaded, not only their shotguns and rifles, but also their cannon and blazed away at this poor chick. They hit it, of course—they made its feathers fly—but it would not die.

Disowned by its mother, kicked out of bed by its brother, it roosted outside in the dark, cold night, and the wind blew through its scanty plumage. But that chicken still lives, but is no longer a spring chicken ; his spurs are long and sharp, his tail feathers have all grown out again, and I believe *he*, with the aid of his brother chick, Vulcanite (who was hatched a few years later), has done as much for the progress of dentistry as any other one thing.

It reached the masses, and it does dentistry as much good to reach them as it does the politician or theologian, and their verdict is generally right. I believe in gold fillings and love to insert them, but when I hear great dentists say, as I heard one say before a convention of dentists a few months ago, that he never had had occasion to use amalgam, I feel sure he *has had* occasion to extract teeth amalgam would have saved. Who is thy friend? He who stands by thee when all is well, or he, who, when trials come and direst need, is with thee still. Ans.—He is thy friend who stays with thee till the bitterest end.

Gold is an aristocrat; he is rich and powerful and is the dentist's friend as long as all is well and strong, and I believe in using gold for filling all teeth where cavities with strong, firm walls exist, and access to them is good, whether they are incisors or wisdom teeth.

But like all aristocrats, gold is dictatorial. He wants this, and does not want that. He wants strong walls, and does not want moisture. Give him what he asks and no metal can compare with him. But when teeth—bicuspid or molars—composed of chalky substance, with cavities of white decay, extensive and horrible, walls frail and brittle come to you to be saved—teeth indeed in which there is desperate need. Do not fill them with gold. He feels above such work as this. But choose rather amalgam, who will unobtrusively and in all meekness serve you then. Now I believe in amalgam, and when I hear men to-day endorsing highly the combination of amalgam with gold in different cases who a few years ago would have been ashamed to acknowledge the use of the former material, I am glad. And where I note that when they do use the two combined, they give to amalgam the difficult part to perform and place it near the cervix of the teeth, in difficult approximal cavities ; and that in these out of the way places amalgam performs its part faithfully although unseen, and sturdily holds aloft to the light of day its more gorgeous companion, I say it has won the fight, and I think it time for the great and learned dentists



to desist getting off that speech: "I have never had occasion to use amalgam;" and also its companion-piece, "any tooth that can be filled at all, can be filled with gold." These speeches were spring chickens once, and they learned to crow early, and crow loud, in season and out, but they are not chickens now; they are very old chestnuts.

What is true of amalgam is nearly so of vulcanite. This was a spring chicken once, and a costly bird it proved the dental profession to rear. It ate up many million dollars of feed, but I think, notwithstanding, has paid its way and aided in the progress of dentistry, and I am glad that old men and women to-day have teeth, and teeth that suit them, and do not go about day after day with their noses and chins continually threatening each other, like a pair of nut crackers, as they did in our grandfather's time. Amalgam and rubber has brought dentistry to the middle and poorer classes without injuring the demand for gold—gold is used more now than ever before, both for filling teeth and as a base on which to mount them. Honor to whom honor is due. Peace be unto them. The year 1855 seems to have been a great year for dentistry. It was in that year Prof. Arthur made known to the dental profession a discovery he had made that will cause his name to be remembered with joy as long as gold is used for filling teeth—I refer of course to his discovery of the cohesive properties of gold foil. It seems to us now almost unaccountable the discovery was not made before, but this detracts nothing whatever from the honor due him who did make the discovery, and with true professional generosity disclosed it to his brothers. Dr. Arthur has also given the profession many other useful things in the line of new modes for operating and new devices for instruments to operate with, but among the fine flock of chickens he has raised was one whose life was soon cut short, whose head was cut off, who was put in the pot and cooked, and most dentists who made its intimate acquaintance during its brief career had to eat of it, and were very glad to at last see its wish-bone on their plates, and they wished over its remains that such a bird would never be brought to life again. I refer of course to the V shaped separations we heard so much of a few years ago.

We have had in our midst many other chickens of this same variety, but none probably so destructive. Among their number were such operations as capping exposed pulps, by inserting gold filling over

them in such a manner as to bridge them over without allowing the gold to come in contact with them, also that manner of cutting nice little pieces out from the pulp and bringing the edges together. I tell you these were a fine breed of chickens and it took a mighty fine breed of dentists to perform such operations successfully.

There was one idea, however, I did hope would have longevity, and that was the extripation of a portion of the pulp and preservation of that remaining, but they proved too delicate for this climate, and are nearly all dead, as are also the pulps they were intended to preserve. But far be it from me to express one thought that can detract one jot or one tittle from the honor due the men who have made discoveries in dentistry.

It would be presumption itself to imagine any thing I could say would effect them one way or another. And if there is a class of men to whom honor is due they are the men. These Christopher Columbuses, if you please, who have pushed their ships from shore and, braving sea and storm, have made discoveries, which make our calling honorable and pleasant. Many of them like Columbus of old have discovered far better than they knew, and when looking only for the Indias have steered their ships upon great broad and beautiful Americas, which they have given their profession freely without money and without price.

But still we will be sailors who sail in row boats, and pull quickly for the shore as soon as the sky begins to darken, can see after time enough has elapsed what discoveries have proven useful and what have not, as well as those who sail large ships and spread much canvas to the breeze.

And we do not believe these large ships will steer from their course to run our small barks down, even if we express ourselves somewhat freely, for our small boats carry the same banner as these large vessels do, and progress in dentistry can be read on them both. But I find it would require a book instead of a paper to even call by name the many new things dentistry has acquired in the shape of medicines, operations, instruments, etc., even in the last forty years. But we have a flock of chickens with us to-day who demand our attention. I hope they will all live; we cannot afford to lose them. We will pick out a few of the largest ones and try and see what their chances of life are. Let us see! There is cocaine, gold crowns and bridge work, immediate root filling, implantation, etc., etc. What a fine flock they will be, if we can but make them

live. I think most of them will remain with us some time. Cocaine, although not hatched in our barn, will, I believe, do us much good—and I believe some way to make it effective in obtunding sensitive dentine will soon be found other than the use of the hypodermic syringe. Gold crowns are with us to remain, I firmly believe, but extensive pieces of bridge work, although a fine looking fowl—yes, *fowl* indeed, they sometimes are—I believe are doomed to be short-lived. Almost all the extensive pieces I have seen had a sickly odor attached to them, that not only made me think they could not live, but that they were already dead. Immediate root-filling and implantation I do hope will live and thrive, but I am very much afraid for them.

It seems to me they will be so liable to become victims to cholera—pip—alveolar abscess or some other fatal disease that the variety will soon be extinct. If implantation will but live and prove to be what some think it will be, why there is almost no end to the help it will be to the dental profession, for it seems reasonable to suppose that if one tooth can be implanted, two can be in the same mouth, and if two, why not a whole set, both upper and lower. Oh for that happy day to come! But Dr. Younger has proven himself to be a great explorer whether it lives or not, and his name will be handed down in dental literature as long as such literature exists. But I am afraid it will not last. I am afraid it will soon have to be cooked, and those who learned to love it during its life, will have to help eat their pet.

But, gentlemen, dentistry is going to stick right to the chicken business—and the years to come will bring forth varieties we wot not of. Soon the ideal filling will come. And I believe there are dentists in this room to-day who will live to insert fillings with a material so perfect—that shade and contour can be preserved so beautifully, that none can tell where filling begins and tooth substance ends, and furthermore more durable than gold. Then indeed will our beautiful maiden have advanced well on her way towards full developed womanhood. Then gold itself will be supplanted, and all the time and energy we have given to acquire the art of wielding and inserting it into decayed teeth will go for naught, except that patient thoroughness which acquaintance with this metal has taught, which will stand us in good stead, no matter with what material teeth are filled.



A feeling of sadness I think would come to most of us after the struggles we have had to master this whimsical metal, to see its place usurped by something else. But when that time comes, as come it surely will, when some substance more in harmony with nature and the beautiful patterns she has given us will be found with which to fill the teeth, let none hesitate to yield up the old; remembering the true aim of dentistry is to preserve the teeth as near nature's models as possible, and that the true dentist is wedded to no particular method or metal. And we will find that in accordance as dentistry nears a positive and thoroughly scientific basis will the demand for it be increased. Let none of us take those old lines I have somewhere read for our motto:

"Be not the first by whom the new is tried,  
Nor yet the last to lay the old aside."

No progress could be made were all to follow such a rule as this. This is a rule many of us are too inclined to follow. We like to keep in the background and let others experiment, and when time has demonstrated their teachings useful we use them with a freedom wonderful to behold, and with an air that convinces our patients that we delve deep in dental lore, and are great aids in dental progress.

While if the experiments prove of no avail we can so easily with supercilious sneer say, "I knew it all the time. Let us rather make a new motto:

"Strive ever something new to find,  
Be always sure thou art not left behind."

This motto I think will prove better by far. Let none rely too much on the "D. D. S." some school has given him. Suppose a dentist who had acquired this title only ten or fifteen years ago had imagined he knew it all and since then had not read the dental publications—had kept away from dental societies—why, to-day he would have found himself so far behind the great procession he could not follow their footprints in the sand, and his patients would have discovered his isolated position before he did.

Let us not be too sure of the incapacity of our brethren, nor too positive of our own abilities.

We work alone so much and see each other so seldom, we are apt to imagine we surmount difficulties others could not, while others are surmounting the same difficulties every day. We live in an age when what is new to-day is old to-morrow, and new things

are coming continually before us. And I expect a hundred years from now we will be looked back upon as a peculiar people, who were so near barbarians they even allowed gold to gleam from their incisors and were not ashamed. But whatever the future may have in store for dentistry, let us practice what seems to us the best, no matter whether it be old or new.

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RETROSPECTION, OBSERVATION AND CRITICISM, WITH SUGGESTIONS  
FOR UNITY AND CLOSER SOCIETY RELATIONS.

BY CHAS. B. ATKINSON, D.D.S., NEW YORK.

Retrospection presents some points for comparison. The history of most professions embraces in their early days empiricism assuming the prerogative to dictate what should be allowable and persistently shutting out all without the confines of its established limits. Methods were some one's property and traded in as commodities. Disposed of by rote as *facts* for use in specified manner for specific purpose. Statements without supporting demonstration and explanation. Causes or antecedents were disregarded. Notification was found desirable to indicate the possessor of these wonderful secrets, and mystification being the basis of practice, symbols offered a sounding means to this end. The worthy among these symbolized *teachers* were mortified to be in company with inefficient co-holders of symbolic worth.

Cliques formed and differential lines of teaching and practice grew and waxing strong sought with might and main to overthrow each other. Individual merit became secondary to school, and back-biting and tale-bearing urged antagonism into even the cliques so that their assemblages became a battle-ground for personal aggrandizement instead of a community of interest for growth of the best. There is dawning a day of deliverance. The waste of effort and paucity of the result to the *individual* reaching even the height of his ambition in the line of old practices is appealing to the common sense of many.

The jealousy which sedulously secreted every improvement as a valuable possession impolitic to distribute gives place to a generous contribution of all discoveries to confreres, opening up new fields to practice and returns to the donor compound interest in the new uses and applications other workers suggest to his mind, thus increasing his ability directly through his generosity.

The power *to* do gives courage in the doing and growth results on growth until an altitude is reached away beyond the possibilities of memorized records of asserted facts.

Antagonism in the light of elevated individual capacity gives place to a mingling of thought and feeling and experiences; and harmony subjugates difficulties.

Some ideas present themselves which may lead to improvement in society relations and to more extended usefulness of the profession at large.

The social element is not utilized to the extent that the success of society meetings under its influence would seem to warrant.

The average dentist does not digest a whole evening of science, and as the greatest good to the greatest number is a principle of all life, the first effort of an executive committee would seem to be to secure a large attendance. Extemporaneous literary or musical efforts offer simple means of reaching a sociable condition. These would of necessity be short as intended merely to pave the way to a harmonious condition of mind. A dinner appeals to a large class of the community, whether dentists or not, and may present the most acceptable means to reach this end.

One plan to increase the interest and usefulness of meetings would be to issue an invitation to all to suggest subjects and make inquiries at any time, which would be filed and considered by the proper committee who could announce the subjects and queries to be considered at each meeting, thereby directing thought to definite channels and insuring something like a consensus of opinion on each subject presented. The "question box" is one phase of this effort. Every society should have a carefully indexed library of all dental publications and all original papers read before it should be kept therein.

A committee on harmony could correlate and adjust variable or antagonistic theories or methods and could consider the merits of reports and make trials to establish the relative values of methods or appliances presented and classify them for ready reference.

The Illinois Society adopted a good plan which if properly carried out would result in much general good. It was to spread the light through popular instruction. An outline for this might be a statement of the conditions of the oral cavity that are curable and their salient symptoms concisely considered, so to give the public a clear idea of what is curable and possible, so that they need



not neglect treatment nor submit to needless extraction or other mutilation.

It is from the education of our patients that greater appreciation of our efforts is to come.

In the direction of clinic management and the establishing of a club combining social and professional features, a paper on Thoroughness, before the Massachusetts Dental Society, June 1889, and published in the *International Dental Journal* of August 1889, is referred to as embodying a broad suggestion covering these objects of society meetings. An extract of which is appended to this paper.

Another suggestion is the formation of a National examining board (the Baltimore and Boston colleges named examining boards composed outside their faculties, but not *requiring* their students to pass them. They were never more than dead letters as they had nothing to do.) Prof. Shepard has reopened this branch of the subject in his paper before the First District Dental Society of New York in December last and it is now further urged with the hope that something other than mere form may result.

A consideration of such legislation as might be necessary to place all the States and colleges on a uniform basis or as near that as may be, would naturally be suggested in this connection.

The possibility of controlling the journals so as to insure the publication in the immediate succeeding issue or issues of reports of, and papers before societies. So that a paper read in March might appear in April and not, as is the case so often under the present system, have them appear perhaps in November or December after the occasion for their composition has been superseded by other matters.

If an independent journal *is* the best, let it put its matter before us at once even if it must be two or three times as large one month to get it all in. An advisory board could receive all reports and papers and portion them out so that several journals would have a fair proportion of the matter presented and yet have it all published promptly and while fresh. A dental union journal could publish it all and select the more immediately important to go in the first month after presentation and follow with the less urgent matter in the succeeding month. Weekly issues could be printed if necessary.

Centralizing tends to stagnation unless provision be made for efficient and sufficient local representation; wherefore the composition of a national board is suggested to be from all sections in equal numbers or perhaps according to population or proportion of dentists in each State. A congress so composed could be elected biennially and this congress could elect the national examining board to serve each year. An appeal from the board could go to the congress if necessary. The congress could meet at the same time and place as the American Dental Association. The Dental Protective Association might affiliate with the central body of the federated unions and thus organization could perhaps be more easily secured.

We must *lay* our course and then *follow* it. But let us try to lay a course possible *for* all to follow and our progress will be steady and rapid.

As Dr. Faught truly said, we have no *standard* methods.

Union is what we need and not in the east *and* in the west *and* in the north *and* south but *of* the south, north, west *and* east.

The social element has lain dormant in our meetings.

Were we friends first the rest would follow.

These suggestions are not offered as altogether original, but are presented with the hope that some of the ideas advanced may bear fruit.

"I believe each section of a certain population should unite their local societies into a general body and locate a permanent home in a central town where semi-annual or more frequent meetings could be held. Such a home to have connected with it a spacious laboratory and operating-rooms, the latter of which could be utilized for meetings, and the operating apparatus stored, for the time being, in the laboratory. These rooms to be fitted with numerous engines, chairs, stools, stands, impression-cups, forceps and electrical connections or batteries, furnaces, vulcanizers, lathes, vises, anvils, and rolling mill, and to be supplied with gas, plaster and sand—in short, such fitting up as a properly-equipped college laboratory and operating-room would demand to the extent of the purpose in view.

This home should be accessible to members of the societies uniting in its support, and upon application to the clinic committee, or committee in charge, to such other members of the profession as desire to give clinics before the section meeting, or any

meeting held in the home. This privilege to extend over such time as might be necessary in previous preparation for the clinic, or in the case of members for experiment, or, perhaps, for regular work under control of the committee in charge, on payment of specific fees arranged by the section.

The supply of the requisite heavier tools and instruments would materially reduce the apparatus a useful demonstration requires an operator to bring, sometimes from a great distance and at considerable expense, and too often at no pecuniary recompense to himself.

It would increase the chances for superior clinics and elevate the tone of these demonstrations as well as increase their worth and scope.

A nice operator deserves nice surroundings, and expert work demands complete equipment of tools and instruments.

Were these reduced to such as the operator could easily carry with him at no additional expense, many of the grave objections to public clinics would be avoided, and the quality of the work offered to clinic committees would be much advanced.

Added to this home scheme might be the establishment of a limited number of apartments for the entertainment of guests of the society ; in fact, the whole scheme covers in many of its features the plant of a post-graduate school as well as a social club, and could be made to serve a very useful purpose in elevating our profession.

These sections might be combined in a union which would publish its own transactions, and could include a publication bureau for the general profession, through which notices of meetings and general professional printing and publishing could be carried on.

Many of the supplies would be willingly donated by members, and the initial expense of such a home need not be very great.

As all things must have a beginning, the effort at first might be small and cover little ground, and grow with the development of its own worth.

In some sections it might prove more feasible to offer meeting-rooms to other societies, which would tend to lower conducting expenses, as is done by the Academy of Medicine, in New York. A bureau of information would naturally result from such a home ; assistants and operators could find mutual help through it ; improvements in methods and apparatus could be encouraged by it,



and opportunities for exercise of beneficent action would constantly arise. The scope of such a home can hardly be named.

I have thought to propose that society members, or others, would notify their local clinic committee of their willingness to give one or more clinics, naming the case or cases and the times when they would hold them, and that engagement could then be made, either by the committee or through it by the operator, by which not more than five dentists would be invited to witness the clinic; and as there would be several separate opportunities thus offered, preferably on regular days, as societies now hold their clinics, many would really *see* the clinic and therefore benefit by the whole operation; whereas, now, one or two *may* see most of a clinic, but the fact of the operator working away from his accustomed surroundings hampers him, as also does the crowding of the many eager to see all they can.

Any clinic committee will agree that to secure good operators on good subjects is anything but an easy task, and a thoroughly good clinic is of immense value in bringing home to the observing dentist the daily need for thoroughness.

I do not think clinical operators receive the consideration or the credit their efforts should call forth. How many of those who observe are willing to step in and operate?

Properly started, managed and supported, the home would be a boon indeed. The establishment of a chemical laboratory in connection with it is a further elaboration of the scheme, as also a library, museum, directory, purchasing agency, receiving office for mail and merchandise. But the opportunity is broad. Can it be embraced? Perhaps, at first, in part."

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## PROCEEDINGS OF SOCIETIES.

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### CHICAGO DENTAL SOCIETY.

Twenty-sixth Anniversary Meeting held in Ethical Society Rooms, No. 45 Randolph Street, Chicago, February 4, 1890.

The society was called to order at 2 p. m. by the president, Dr. P. J. Kester.

Dr. E. L. Clifford read a paper on

## THE CORRECT THEORIES AND PRACTICES OF THE DENTIST OF TO-DAY.\*

Dr. Edmund Noyes, in opening the discussion, said: I had an intimation a short time ago that the two papers would be read before the discussion on them took place, so I am not quite at the point of preparation I expected to be and I am not going to allude to more than one or two points.

By what standards of judgment shall the correctness of theories and methods of practice in dentistry be determined? Two different plans may be pursued for the purpose of arriving at opinions upon this point. The first is by a careful consideration which shall lead to a logical conclusion by means of attention to the object to be accomplished, the various circumstances in any way related to it, the different methods of procedure that may be possible, etc., etc. If to this is added the experience of successful results in practice, we have got as good a foundation upon which to stand in our theories or practice as can be obtained. The other method of procedure is to ascertain what is the practice or opinion of the dental profession? Since if it can be shown that a certain mode of procedure or certain method of practice is pursued by almost the entire profession, then it must be considered that it is the result of the deliberative opinions and judgment and experience commensurate with the average ability of the profession at large. But if in such a case as this there is dissent only by a few, it becomes necessary in that case to notice particularly who the few that dissent are, to ascertain whether they are the men who are exceptionally able and competent, possibly those who can rise above instead of falling below the average standard of the profession. These two lines of determination, although we may not formulate them in our minds, we are continually applying practically to the best of our knowledge—facts which determine the conclusions upon which we rest, and we are watching day by day in our practice to see whether the clinical results and effects correspond to the theories, for although theory, if it is complete and rests upon all the facts, is a perfectly safe guide, yet fallible men seldom know whether it is complete in this respect or not, and so the tests of operation in practice are continually necessary and must be the ultimatum to which the theory must be subjected.

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\* See page 91, February, 1890, DENTAL REVIEW.

This field, as the essayist has very well suggested, is very large indeed—so large as to make it very difficult for me to determine what points in it to take up, and it seems to me best, although the essayist showed me the kindness to let me read his paper before hand, to rather extend the range or to take up additional or different points in the main, than to spend any time in a criticism of anything which has been said or brought out in the paper; that is, it seems to me better to discuss the subject than the paper. Some things which were referred to in the paper will bear a little enlargement I think.

First, with reference to the use of non-cohesive gold, which is so commonly well understood that I shall not be justified in spending much time upon it. Theoretically, non-cohesive gold is pliable and adaptable. Cohesive gold admits of solidity, and, of course, cohesion of the mass. The outline of procedure mentioned in the paper is founded upon these two qualities. These qualities furnish a natural reason for employing it in this way, using the non-cohesive gold so far as circumstances will admit in contact with walls and over the edges of margins, and cohesive gold wherever solidity or cohesion of the mass is required in order to perform the work to be done. The thing which I wish to say in regard to this matter especially is that it is very easy to misapprehend the distinct and positive differences that are necessitated in the manipulation of these two forms of gold. Soft gold feels so soft and pliable under the instrument and is so obedient to our will if handled skillfully that many men are under great temptation to use it in far too large masses and to suppose that the force which is put upon the surface condenses it throughout evenly and solidly. This can be done if the circumstances are exactly favorable and the resisting walls strong enough, and the force is directed in the right way, but it needs a wedging force rather than a solid compression from the surface downward, and it will not in large masses crowd itself into small and irregular nooks, corners or undercuts. If any of these things are in the bottom or corners of the cavity they must be filled in detail, whether you use soft or cohesive gold.

Gentlemen, the perfection of work in gold requires the closest attention to minute details, and the use of non-cohesive gold will not release you from that necessity and that obligation. The opinion is often expressed that non-cohesive gold does not require very firm or very great solidification, that it is not necessary to consoli-



date it to anything like the same degree that we have been in the habit of doing with cohesive gold. If solidity is not very nearly as complete as can be obtained the mass of non-cohesive gold which has been used as a foundation will, in the force afterward exerted upon it in the packing of cohesive gold over it, or in the subsequent force of mastication perhaps—if that comes down it will be so much condensed as to no longer fill completely the space in which it was put. If it lies in such a way that the condensation spreads in every direction against its walls without the movement of the portions of cohesive gold which have been consolidated above it following it out, it will be very well, but there will be a great number of instances, unless you are watchful and unless your non-cohesive gold is well packed, in which there will be some corner that, instead of spreading toward the wall, will go away from it. It is only another point in the details, and minute accuracy in all points is very essential.

The essayist has alluded to several questions which have received constant and a very great amount of discussion, and which if touched upon at all at this time should only have reference to the principles and relations that are to be considered and the problem which is to be solved. A great deal has been said in the last year or two in regard to root-canal fillings and in regard to the leaving of root-canals without filling, and the whole subject has been referred to somewhere lately as though it were chaotic and as though the profession had no established and recognized theories and practices upon that subject. Now, I take it, gentlemen, that it does not represent the state of the profession in regard to it. Here is a problem which requires certain things to be accomplished; it is one which has a good many roads to reach the same point, and the differences in the minds of the profession and in the practice of the profession have relation more to the methods of procedure than they have to the things which they seek to accomplish.

The filling of a root canal involves, as essential steps for perfect safety, first and constantly, aseptic or antiseptic procedures, dependent upon the question whether the root canal, when it comes to us for treatment, is in an aseptic or antiseptic condition. If there is putrefaction or suppuration present in the pulp or at the apex of the root, the first thing we have to do is to use antiseptic treatment, and for this purpose the first step, to my mind, is cleanliness so far as it is available. Sometimes that will go much further than

it will in other cases. There are a great many cases in which absolute cleanliness is very difficult to accomplish. You cannot always do it by squirting water into the tooth from a syringe, or by wiping out the canals with broaches wound with cotton, etc. By using all of these procedures, or others which are available, absolute cleanliness, which will amount to asepsis, can seldom be accomplished without using antiseptics or disinfectants. If sepsis is confined to the pulp canal, and has not yet manifested itself in the tissues outside of the tooth itself, such cleanliness can sometimes be accomplished without danger of rendering septic the territory around the apex of the root. Practically, according to my clinical observation, the safest procedure is to remove very carefully what débris can be got at without the slightest danger of carrying anything through the apex of the root, then placing in the canal a trustworthy antiseptic which is diffusible. The old practice, and I expect it is the practice of a great many dentists now, is to put 95 per cent carbolic acid in such a place as that. The objections are coagulation, which will put a stop to any drainage which may happen to be necessary, and its lack of diffusibility. This last is illustrated by Dr. Miller's account of his culture experiments in relation to the etiology of caries. He soaked a carious tooth for an hour in 95 per cent carbolic acid, then removing all the superficial layers of carious dentine, he had no difficulty in obtaining living organisms from the deep layers that would start the growth in his culture tubes. His object was to destroy any possible growths that may have gotten there by the mouth and were alive, and use only those germs which are peculiar and necessary to the development of caries. One critic tried to throw discredit upon the experiments that Dr. Miller had made, and said there could be no life in a tooth after being soaked an hour in carbolic acid. The experiments demonstrated that for certain uses carbolic acid is not the antiseptic or disinfectant that will do the work we want it to do. I have found the volatile extract eucalyptus, the oil of cloves, and the oil of cinnamon very satisfactory in my experience. After being enclosed in the pulp chamber for two or three days, I have found no evidence of sepsis from the contents of those canals afterward.

Of course it is taken for granted that all these procedures have been done under the rubber dam. When we get such a canal free from sepsis, we will keep it so by making a stopping for temporary and treatment purposes that will keep out everything, and it has

been my feeling in recent years of practice to consider that I have not one of those cases under treatment until I have it enclosed with a temporary stopping that will keep out infection from the fluids of the mouth. There may be in some instances so much and so rapid a discharge that such a cavity will not tolerate a temporary stopping, and it must be disinfected frequently for a while until it will tolerate a stopping. You can tell usually whether there is a condition present that will require drainage or not. In almost every instance where there is the slightest evidence of vitality toward the apex of the root there will be no danger in a tight stopping, while in a vast majority of other instances it can be inserted with perfect safety. Now, when such a root canal is ready it does not make a great deal of difference what material is used to fill it if it is only filled. The things that will stick to the walls on the way up there and prove difficult or impossible to get to the end are difficult to manage on that account. If you can overcome these difficulties, all right. The things that will shrink unreasonably are open to objection on that account, and the least quantity of shrinkable material you can use the nearer you come to absolute safety on that ground. This problem is not easy of perfect solution; we have to fall short of absolute and ideal perfection in the operation in a multitude of cases, and it is those practitioners who have patience, skill, and judgment that will get the nearest to ideal perfection, who will have the fewest abscesses afterward. Let it be remembered also, notwithstanding the statements of some man in the International Congress, that perfect asepsis and a tight filling will not make open root canals safe and harmless. An open root canal is sure to become filled with material liable to putrefaction upon the slightest access of infection. It is like a bonfire ready to light, and our observation indicates that they get lighted sooner or later. There are so many sources from which infection may be obtained. The thing that will start the formation of an abscess in such a place may go through the circulation; it may go through the smallest leakage around the fillings, and perhaps may come from other sources.

There is one point I would like to speak of in regard to the correct theory and practice in capping pulps. Here, it seems to me, is another case in which the profession are at variance rather in their methods than in their theories, rather in the means which they take to accomplish a result than in the result which they seek to reach.



From my observation, reading, and experience, I am quite convinced that it is comparatively easy with a good many different materials to cover up a pulp which has been slightly exposed and is aseptic, so that it will live, and under favorable circumstances or in favorable cases there is no reason why it should not be attempted—indeed, in many instances there are the most urgent reasons why it should be attempted, in the case of young people especially. There seems to be a manifest disposition to set a small value upon dental pulps, as old age approaches particularly, and the clinical experience of their intolerance of large masses of metal in close proximity to them must constantly be taken into account in determining whether we will attempt to save the pulp alive or deliberately destroy it. The theories which have been advanced that no pulp should ever be destroyed, that no arsenic should ever be used, that even half a pulp if it remains alive should be preserved, are fallacious theories.

I had in my practice yesterday and to-day a striking illustration of what I have just said. A patient came to me with a lower molar tooth containing a large gold filling. The pulp was not exposed and was protected with a layer of Hill's stopping covered with a layer of phosphate, and a filling inserted over that, covering the entire distal face over the entire grinding surface, and the distal buccal corner of the tooth. Yesterday the patient came to me with a history of a night of pain about two months ago, followed since by elongation, constant soreness, and tenderness on the inside of the mouth opposite one of the roots. The symptoms made me think at first that the pulp had died, until the patient informed me that it was exquisitely sensitive to hot and cold water, and cold water demonstrated that fact very effectually yesterday when applied. This condition has been going on for two months. If that pulp had had the slightest irritation or infection through a leaky filling, it would have been dead instead of in the condition I found it. It would never have taken two months to bring about that result. A drill demonstrated its vitality, and the application of arsenic was followed before night by an entire cessation of the sensitiveness to heat and cold. This was a case in which it was, in my opinion, wholly unjustifiable at the time to destroy the pulp, but experience with it has demonstrated that it would not remain alive.

I bring this matter up to show that these considerations are justly and fairly to be taken into account when we question the

preservation of pulps. They are as important considerations in this regard as the mere questions of therapeutics and of mechanical operation, as to whether we can cover up a pulp and have it live. I take it that the question of successful capping of pulps was answered in the affirmative in this case by three years of comfortable use and by the unquestionable evidences which I had yesterday and to-day that its vitality is not yet gone.

Dr. A. W. Harlan: I do not rise for the purpose of making any remarks on Dr. Clifford's paper, but it seems to me as the opening speech has been made on it, it would be better that the other paper (Dr. Wassall's) be now read and the discussion on the two papers continued, so that each speaker can criticise or condemn any theories or statements that have been advanced by the essayists, and in-dorse anything that he may see fit.

Dr. J. W. Wassall then read a paper entitled:

THE FALLACIOUS THEORIES AND PRACTICES OF THE DENTIST OF  
TO-DAY.\*

The President: In the absence of Dr. J. N. Crouse, who was appointed to open the discussion on the paper just read, I will ask Dr. Cushing to open the discussion.

Dr. Geo. H. Cushing: Mr. President and gentlemen—I think it is unfair to ask me to open the discussion on a subject upon which a member of this society is supposed to have prepared himself, and I do not feel prepared to do so.

[At this juncture Dr. Crouse entered the hall, and the president recognizing him, informed him that the discussion on the paper of Dr. Wassall, which he was appointed to open, was now in order.]

Dr. Crouse: I have seen a synopsis of what Dr. Wassall told me he might say if he had time, and if I wander from the track of the paper it will not be my fault. The essayist wrote me that the first thing he would discuss would be *dental education*. It occurred to me that if he stopped there and do that justice he would not have time for anything else. That subject may be considered threadbare, and yet it is not. It is the foundation of what our profession *is* and *must be* hereafter. The plan of education and the kind of matriculants must be the basis of our future profession. Just what that is going to be, we do not at present know. However, if the signs of the times indicate anything, it is that the plan of education

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\* See page 100, February, 1890, DENTAL REVIEW.

and the kind of material which go to make up our profession, are going to undergo a very great change. We look forward to that reform.

You probably have read the paper of Dr. Shepard in which he speaks of the plan of education, criticising especially the plan of clinical instruction in dental colleges. It is a sore regret to go into different dental colleges and find forty, fifty or sixty young men operating with one instructor—one man to show them how to do the work. In the matter of education, colleges are well enough in their places as collaterals to prepare young men, but to go out and serve a community properly, clinical instruction is where they have got to get that knowledge. If they do not get it at the college, they have got to get it by experience, by contact with other practitioners, and by societies. This is not the first time that this suggestion has been thrown out, and I think the dental profession is ready to improve upon it. So much for that.

*Dental Legislation.* This deals with dental colleges, and I agree with the spirit of the Massachusetts law, and as soon as Dr. Shepard said there will be an improvement in that law, I said that is the best law that has ever been passed, in that it will recognize no colleges, will pick out the material that goes to them and make graduates stand an examination before they are permitted to practice. I think in time we shall have laws in the different States that will compel all graduates to be examined and see if they are fit to practice dentistry, by a disinterested committee. I think Dakota has a similar law and one or two of the other States—Minnesota is one, I believe. I think to-day that our State (Illinois) is far behind in this regard. Several States have better laws than we have, and things can be improved in that direction so that we may come to the front.

The next topic, I believe, is the *Status of Dentistry*. If the hints thrown out in the essayist's letter to me before writing his paper were carried out, I do not think the medical profession would be in any way lowered in its average by mixing thoroughly with the dental profession. I think the dental profession stands higher than it does in point of intelligence and education. The gentlemen who differ with me in regard to that must remember that we must take the class of doctors all over the country. You must take the men in the back cities and towns as well as the teachers and lecturers in colleges in the large cities—in fact, take the whole medical pro-



ession throughout the country, and you will find that they have got as many scalawags as we have. I do not agree with the theory advanced by the essayist to the effect that we are not prepared to join hands with the medical profession in point of intelligence and education, and that we do not stand equal to them.

In some remarks I made in New York the other day, I said we had spent a great deal of time during the last two or three years in trying to find out whether we belong to the medical profession or are an independent profession, and the statement was made that we are not an independent profession; that we do not come up to the standard of the medical profession, and that as a consequence we are behind. The best thing for us to do is to stand together in this matter—we are big enough, and by legislation and improved curricula of education in our colleges, we may place ourselves far beyond where medical colleges can get. We can take better care of ourselves by doing for ourselves and by educating ourselves separately.

*Cause of Dental Caries.* I read the essayist's remarks on this subject, and I believe he took the ground that it was foolish to think that microbes of themselves caused caries. I was glad to hear him say that. I do not know whether he said the microbes bored the holes or not. (Laughter.) For my part, I think that they probably cut a figure indirectly in caries. I have an idea that we will switch off and hear less of that by and by, and that we will find that microbes have less to do with the causation of dental caries than we had supposed for years. There are mysteries in regard to dental caries. Take, for instance, erosions. I have thought of that question time and again. I had a case a few days ago in which the erosion ran directly from the cutting edge toward the gum and out in a sharp groove up the central incisor, then directly across the cusp in the other direction, differing from any erosion that I have ever seen. I have some very accurate casts of this case, which I shall be glad to show any of you. There are many questions in regard to this subject that puzzle me; they are disheartening to me. We find that caries goes on in spite of everything we can do, no matter how faithfully and well our operations are performed, and how much instruction we give our patients. It comes on and gradually the dental organs are destroyed. I have had many cases come to me from time to time, and I consider the matter of operating for dental caries a failure.

I believe we can do a great deal by teaching our patients how to take care of their teeth. If you will examine 25 cases that come regularly to your office, you will find very few of them know how to take care of their teeth properly. They must be taught to do it. You will find places that the patient does not touch and does not clean. I make my patients bring the tooth brushes they use to the office and see how they brush their teeth, and I find that very few of them know how to do it properly, and it is our duty to instruct them. We can do a good deal in that way.

There is another point I want to touch upon. I intended to write to the officers about it, but neglected it. It is the matter of soap in connection with dentifrice when cleaning teeth. I see that the committee who revised the last treatise, which was ordered to be printed and circulated by the Illinois State Dental Society, condemned therein the use of soap. I can understand how they might avoid the use of it, because of its being disagreeable. I think I made the remark here once in a discussion that soap allowed the brush to pass over the teeth without taking off the deposit. Now, if this is true of soap on teeth, it is true of soap in washing clothing, or in any other way where you want to cleanse the surface. I have found soap an elegant thing in removing the fungi and the soft deposits about the necks of teeth. If I want to get a tooth absolutely clean so that the sandarac varnish will keep my dam on, I always use some soap. After I read that treatise I would not circulate it among my patients, because I would have to take back what I had been saying to them time and again.

The next subject is *Imperfect Root Filling*. While that subject is not worn out and never will be, yet it is one of the uncertain things of practice. No man, who has ever filled the roots of teeth miscellaneously, is absolutely sure of what he has done. He thinks he has done the work and says, "I feel quite sure that root is filled."

The matter of drilling roots so as to get into them is uncertain practice. You are liable to miss the canal and then never find it again. That is the way it serves me when I try to drill out a very difficult root. If it is a difficult root, I do not think I can drill it out. I take chances of simply getting it properly prepared for filling, so that it is closed tight, and I am in the habit of using oxy-chloride of zinc with gold foil, then pass the gold on the broach as far through the oxy-chloride as I can, and this is as safe a way of filling the roots of teeth as I know of.

DR. G. V. I. BROWN, of Duluth, Minnesota: Mr. President and Gentlemen—I feel disposed to take advantage of your kind invitation for visitors to participate in the discussions on the papers that have been read.

Minnesota has such a law as has been described, and I believed the only State in the Northwest. The effect of that law I cannot say much about at present, as we have had but little experience with it.

So far as the graduates of our colleges are concerned, I can say for one that the preparation which students seem to have for practicing dentistry is a most disgusting one. They seem to be thoroughly prepared to go through certain routine questions in the textbooks, but outside of that, or so far as practical work is concerned they know very little. They seem to think that is something which they are supposed to gain in the course of time. We find them incompetent as operators, and in many instances deficient theoretically. Of course, gentlemen, there are exceptions. There are good students everywhere, and those students will learn. The effect of that law is going to be that graduates will not be allowed to practice dentistry unless they are thoroughly competent, and if that be the case, colleges will soon become discouraged in graduating them. We in Minnesota, as I have said before, have got such a law as has been referred to, and we feel that the States must stand together in this matter. It is going to do much good.

With regard to capping pulps, I would like to see physicians intelligent enough that when they find patients suffering from so-called neuralgia, due probably to the dentist having capped a pulp which he had no business to cap, they will send such cases to us. I have had some practical experience in that line in my practice lately where a pulp had been capped, and the patient suffering from neuralgia went to a physician who kept him under treatment for for quite a while and then sent him to me for further treatment.

People have had the "grippe" in our city, and I have destroyed more pulps in my practice than ever before, and I do not think that they were in any way connected with this trouble. The patients came from different parts of the State. The fillings were large and the teeth in some cases seemed to be perfectly sound. Some of the cases had been treated for weeks by physicians and then sent to dentists for relief.



I should like to see more harmony in the direction of physicians, so that when patients go to them with some trouble about the face, neck, or head, or anywhere within our region, they will send them to us. We can do them more good.

DR. HARLAN: Mr. President—After listening to the reading of the first paper by Dr. Clifford and hearing the remarks of Dr. Noyes, I came to the conclusion that the speech Dr. Noyes made to this audience would be far more instructive, to put the details into practice, than any speech I might make, because he is essentially a detail man; that is, he conceives a certain thing, he sees it in his mind, goes to work, and follows it from the very beginning until the end. Now, I am more of a generalizer. I hate details. One of the things that hinders me from becoming a successful teacher is because I feel that the student ought to be able to know anything that I possibly do and say and see the point at once. Of course I know that it takes years of study to arrive at a definite conclusion on certain subjects. So much with reference to that.

With regard to the first paper as to the correct methods of practice, I have no fault to find with the subject and the way in which it was handled by the essayist, except in one point, and that is this: If the experiments are true, and if they tell the truth, it is fallacious to wipe out a cavity in a living tooth with an escharotic. I say it is fallacious to do it. An instance was related by Dr. Noyes, based upon the experiments of Dr. Miller, to prove the fallacy of that. Some people may not estimate it at its true value. They may fail to see what is meant to be conveyed. They may have a very inadequate idea of what it is to try to do the correct thing in practice, and nothing will convince them except they have their own hands, fingers, face, or any other soft tissue burnt. To dispose of escharotics as it relates to this subject, I will say, and I have said it over and over again, and I will say it as long as I practice dentistry until somebody can prove to the contrary, that all substances that coagulate albumen are hindrances to diffusion and are self-limiting in action, and that they are only useful in those cases where diffusion is not needed. I feel so confident of this that no one has ever up to this time had the temerity or had the patience to go to work and perform a series of experiments that would prove the untruthfulness of this statement. That is all I have to say about that.

The essayist in considering the correct methods of practice said nothing about the correct method of separating the teeth in order

to gain space for filling. I would hold it to be a correct method of practice to separate the teeth slowly, except in a very few instances where separators may be used for the purpose of examination. He said nothing about the correct methods of filling roots of teeth, and as the author on Fallacies said something about that, and as Drs. Noyes and Crouse said something about it too, I do not know that I can say anything except that it is about time for the dental profession to adopt some correct method of filling roots of teeth which will not subject us to humiliation and ridicule by all scientific authorities when they come across the various methods, correct and otherwise, that are practiced by dentists. One of the reasons why there is a lack of harmony between physicians and dentists is because dentists themselves are so faulty in their manipulation, they are so inadequately prepared for the practice of dentistry, and they so little use their faculties of thinking or doing that they bring the blush of shame to the cheek of every honest dentist who tries to do the proper thing. I tell you, gentlemen, what we want is a proper appreciation of professional dignity and action. First prepare yourselves to be respected, then learn to respect yourselves, and you do not need to plead for recognition.

Now with reference to the correct method of root filling. I cannot stand up here and say that any method I would advocate is the correct one. How could I do that? In a recent issue of a journal was published a list of methods of filling roots of teeth, including materials. One uses oxychloride of zinc, one oxyphosphate of zinc, another uses sticks of wood dipped in paraffine or carbolic acid, etc., etc. Is it not confusing to a beginner to try to select a correct method of filling the root of a tooth? You have to consider all these things.

I will make one more effort in the right direction, and that is this: It is fallacious to fill the roots of teeth with oxychloride of zinc; it is likewise fallacious to fill with wood, cotton, or any gummy substances soluble in alcohol. It is fallacious to fill the root of a tooth with any substance which is capable of absorbing of a gas. I make that general statement. I would like you to know, if you are not aware of it, that it is impossible to make a vitreous body so completely glazed but what gases will pass through it.

Experiments were made before the Chemical Society of New York with reference to sewer pipes, tiling, glazing, etc., and Professor Doremus proved that sulphuretted hydrogen and phos-

phoretted hydrogen would pass completely through glazed pipes. In consequence of the absolute law, the positive demonstration of that fact, it is fallacious to fill the roots of teeth with anything that is an absorbent. You can fill them with gutta percha if you want to, that will not absorb moisture or gas, the whole world to the contrary notwithstanding.

With reference to capping pulps. I think the essayist on the correct methods and the essayist on the fallacious methods are about right. We only cap the pulps of teeth when we are compelled to cap them, that is we will suppose that our judgment has been educated to a point where we know that some good will come from it.

Nothing was said about the correct treatment of abscesses, and I do not feel as though I should say anything now, because I do not want to take up too much time, and the reason I am making this speech is because I am going away to attend to other duties.

I will now say a few words about other fallacious methods. Disinfection is correct in spite of the non-believers who use water to produce it. Water is a bad thing to inject into the root of a tooth when you have just removed the pulp from it. It is a bad thing to inject into the root of a tooth when you have bored into it for the first time and pus wells out. I think I should say it was a correct thing in practice to use arsenic for the destruction of pulps of teeth; I merely make that statement.

Mr. President, one of the fallacies of the present day is to work all the time and not to devote some of it to experimentation, study and recreation. It is a fallacy I say, because men are entering this Hall one after another with pale faces and bloodless countenances, and in the absence of rosy cheeks, rotundity, robustness and erectness, I say what a pity it is that dentists stay in their offices working from early morning till late at night. It is a fallacy to try to devote all the time possible to doing operations by artificial light. It is a fallacy to abuse your eyes. If these few words will do you any good, and you will try to reform, I hope to see you looking better when we celebrate the 27th anniversary of the Chicago Dental Society.

It is a fallacy to take discs and cut between teeth and mutilate them and leave them so that a tooth will make the owner eternally unhappy. It is a fallacy to drill holes at the necks of teeth after the



pulp has died with the expectation that that will be the cure all. It is a fallacy to use two metals in different positions in a living tooth. I do not care who disputes it; he cannot prove the tenableness of his position.

It is a fallacy to paint the necks of teeth with chloride of zinc, nitrate of silver, or any other substance with the idea that it will arrest decay. It not only aggravates it, but makes a more distressing cavity for the present or succeeding operator to fill.

There are so many fallacies, Mr. President, in the practice of dentistry that I fear, were I to enumerate them, it would take up to much of your time, so I will exit.

Dr. C. P. PRUYN: Mr. President—I do not know that I can say anything of special importance. I did not hear the papers. I might say a few words, however, upon the subject of capping pulps. That subject is always new and yet old. I am very glad to see that the profession generally are coming now, as I take it, to a commonsense understanding of our theories in regard to capping pulps. I say commonsense understanding of the theories for so many theories have been advocated, so many different methods employed with such various results that now from the experience of the past we come just to that point where we understand that it is seldom we can cap pulps with successful results, so that capping pulps at the present time is something that is done only to a very limited extent. You will remember that twelve or fifteen years ago this same subject was discussed in our societies—the New York Society especially is the one with which I am most familiar—and dentists at that time were capping everything. Every pulp that presented itself, regardless of its condition and the physical condition of the patient, was capped. They capped the pulps of patients from ten up to ninety years of age, whether the pulp was recently exposed or had been exposed for some little time, whether inflamed or had gone on to suppuration. Now, the same men who had been doing this, to-day tell us that they are capping pulps very little, because they find from experience that their results are not satisfactory. We went upon the theory that pulps must be capped regardless of their pathological condition, and that is where one of our mistakes has been. We have attempted to practice as specialists. All specialists are open to more or less criticism. How apt we are to become narrow in one particular line and dwarfed in others. We should practice more as dental surgeons, and not as

mechanicians simply. The greatest trouble with us all is that we have drifted too much to the mechanical side. This is where our thought and development have been during the years past—how we could make a nice filling? We study the pathological side of the question now, and here we must look for our greatest results in the next ten years. As soon as we understand pathology thoroughly, its application and its relation to our specialty, then in the broad sense of the term may we expect to be called dental surgeons.

DR. J. H. WOOLLEY: I was very much interested in listening to the papers, for they epitomized the subjects we have under discussion. There is one point in particular that pleased me, and that was in regard to wiping out the cavity of decay with antiseptics previous to filling. I have thought a good deal in that direction as to whether much of the decay that has occurred in teeth after having been filled, was not due alone to a lack of the use of antiseptics. If any one will observe the amount of effete matter in the tubules of a devitalized tooth and in the pulp cavity, he will find it requires quite a long time to remove all moisture, which can be conclusively determined by not hearing any more sissing. Now, in a cavity of decay that does not reach the pulp, may not some of the amount of the effete matter to be thrown off by disintegration be left in the tubules and this antiseptic remedy be a benefit in that direction? It seems to me that thorough investigation in that line might prove that much of the decay after a tooth has been filled, is caused by the action possibly of microbes or the débris that may be in the tubules.

DR. E. NOYES: I want to say a few words about soap. The action of soap in cleansing hands and clothing is to assist the water which is used as a solvent. The mass which we desire to remove is more or less soluble in water, but it is more soluble in soap and water. The cuticle itself is soluble in some degree at least, and is much softer by the use of soap and water. The solvent quality of the soap upon the cuticle is the principal reason for its use in cleansing. The cleansing of teeth must be accomplished by friction, which is the essential idea and method upon which it is to be done. Soap is soluble and diminishes friction. It is not to be denied, as suggested by Dr. Crouse, that soap, brush and water will cleanse the necks of teeth and margins of gums thoroughly from the soft deposits which are there. The soap exerts friction enough to do it, but it is my belief that the cleansing is not facilitated by the use of soap. I believe in addition—without being able

to give at this moment any scientific reason for such a belief—that the alkali of soap is not injurious to the cementum of teeth in contact where the gum has slightly receded. I do not believe it hurts the enamel of teeth, except where it is continually used. It probably makes the teeth more yellow than they otherwise would be. I have good reason to know why it was not recommended in the little treatise referred to as an element of dental cleanliness when used in considerable amount.

If I may be permitted to speak two minutes longer, I will tell you a way to make a good root filling.

The suggestion has been thrown out that you may fill the roots of teeth with gutta percha. I find by long experience that it cannot be done so satisfactorily. I use the Hill's stopping which is better than base-plate gutta-percha or any of the forms in which gutta-percha stoppings are made. The Hill's stopping with the pure volatile extract of eucalyptus is sufficient, and you may carry it to the extreme limit desired. Eucalyptus is a trustworthy antiseptic in this connection and a permanent one when used in that way. It is my belief that the combination of materials is such that the shrinkage is less likely to be the case. It must not be forgotten that oxychloride of zinc shrinks considerably even mixed in its best form, and in a good many instances will shrink so as to result in a series of granules instead of being a homogeneous mass. Now, if a root canal is thoroughly dry and wiped out with the slightest trace of eucalyptus, and the Hill's stopping is dipped in the eucalyptol bottle it may be carried immediately into the canal and churned in as far as it is necessary to go. If you can once get within the canal and the canal is dry, it is only a question of the proportion of eucalyptus; you may save enough to carry it to the end. I think I am very slow myself, but I find it necessary to spend half an hour or an hour in filling the roots of some molars. It cannot be done in a minute or two with this material. Ten or fifteen years' experience with these materials justifies me in saying that they are trustworthy, clinically. Not one root in a hundred which I filled, gave me reason to suppose they would make trouble on account of inadequate filling, unless it be in those cases in which I could not get into the buccal roots of molars, and these are the ones which require time and patience on the part of the operator, but which can be filled to the end if enough time is spent to do it.



DR. A. E. MATTESON: I agree with what Dr. Noyes has said in regard to gutta-percha. I would like to ask him why he prefers the Hill's stopping to the base-plate gutta-percha?

DR. E. NOYES: The reason is that the Hill's stopping is composed of a large proportion of oxide of zinc, which is a solid and unshrinkable material in itself, and it is more readily softened and disintegrated into a pulpy mass which can be worked up in the churning process I have spoken of, and stays where it is placed.

DR. A. E. MATTESON: I want to say that I prefer the other in the opening of the canal, and for the purpose of setting the crown I use the white gutta-percha. The oxychloride of zinc is unreliable. You cannot tell when you are striking the tooth or the gutta-percha. With the red gutta-percha you can. I believe the red gutta-percha forms a solution which is very difficult to remove and that it even penetrates the tubuli of a tooth if it is dry.

DR. H. A. COSTNER: This one subject of filling the roots of teeth has been agitating the dental profession all over the world. The first ten years of my practice I was going from pillar to post, not being able to find anything that I considered reliable. Of course you can fill the roots of some teeth with almost anything—I mean the ordinary teeth where the crowns are intact. I fill the roots of teeth with gold and I have no reason whatever to change my practice. I give absolute satisfaction. Gold is a very satisfactory filling. You can roll No. 4 gold between your fingers as fine as horse hair, and after doing this you can place it in the canal with your pliers until you place it far into the root. By using very fine gold, by taking fine pliers and keeping a little bit over the end of the mallet, after having marked the end of the root, keeping it down, you can get the material in there and know that the root is filled. It does not make any difference whether you get anything else in or not. When you get the upper end of the root filled there is nothing else going to get in there if this method is followed explicitly. There are certain roots which are more difficult to fill. Take, for instance, the mesial root of a lower molar, it is impossible to get anything in there in many instances. You cannot fill such a root with anything. I never bore into the roots of teeth, because they are not strong always, and I think it is foolish to do so.

Another thing I wish to mention: I venture to say that in the next twenty years there will be twenty men to one filling the roots of teeth with gold, because it seems to me to be the absolutely cer-

tain thing before the profession. When I first commenced to practice dentistry it was the practice of the profession then to cap all kinds of pulps. The longer I live and the longer I practice, the fewer pulps I try to cap. I do not think it is a successful operation. When a patient comes to me, especially if it is hard for him to bite on a certain tooth, I destroy that pulp and I never have any bad results.

As to educating the medical profession, I want to say that I do not think there is any dentist that comes from a college but what knows more about the teeth than any physician. Physicians know very little about the teeth. Some of them do not know how many teeth they have in their head, whether the lower molars have four roots or one. The average physician will put a patient suffering from neuralgia through a long and varied course of treatment, then the tooth will ulcerate perhaps, the face of the patient will begin to swell, and then he will treat the case for erysipelas, the case finally terminating in abscess of the tooth.

Dr. E. M. S. FERNANDEZ: I am sorry I did not hear the reading of the papers. I do not know what points were brought out. I wish to say a few words on some points brought out in the discussion. In the first place, with regard to the filling of roots. What is the right way? Since the human mind is not perfect as it is, there is no right way, and there is no wrong way of filling a root. The way for a man to fill a root is the way in which he succeeds best, and that is the right way for him, and any other way would be the wrong way.

About ten years ago I made some remarks regarding a method of my own of filling the roots of teeth. I have found since that it is an old method. At that time I supposed it was my own. The root would be prepared about the same as though there were a crown to be placed on the tooth, and the filling should be the same. The instruments used must be cleaned by myself. Much depends upon the tooth, the kind of root, etc. I always bore them out. The kind of instruments used in boring out roots is important. I use an instrument that has a fine guide at the end, and then a reamer of any kind next.

First of all, I have my broach, and it must be a smooth broach, as a guide. On that broach I keep a little piece of rubber, and by means of a probe I get as near as possible to the depth of the root. No man knows when a root is perfectly clean and when it is per-

fectly filled. We do not know unless we extract the tooth after it has been filled, and then we do know. I know it is cleaned out at a certain depth, the size of the canal, etc. When the root is in that way, I first take a piece of gold foil rolled in a tapered point, and that is what I close the apex with—nothing else. The rest I can fill with anything I want. I use in some cases gutta-percha. I do not care to fill all roots with gold, for if I should find it necessary to open them it would be a little difficult to do. I therefore prefer to fill the balance of the root with something else. On my ledger I mark the depth of the root as near the neck of the tooth as I can, and then if at any time in the future I should reopen this root I could get very near the length of the tooth, and would know whether the gold has worked out or not.

I think there is one good quality with the dental profession in this city, and that is the respect they show to each other. When I go to a dentist's office, even when he is very busy, he will show me anything he has, and give me anything I want. Is there any better proof of respect than this?

The discussion on these papers was then closed by Drs. Clifford and Wassall, as follows:

DR. CLIFFORD: Mr. President, I want first to thank the gentleman who opened the discussion upon my paper, as well as those who have been kind enough to criticise it, for the leniency with which they have treated it. As I stated in the paper, the field is large, and it would be impossible to cover it in the time allotted.

I will only detain you to answer one or two points. First, the gentleman who opened the discussion asked, "by what standard are we to judge what is correct and what fallacious." His answer would infer that it was my purpose to convey the idea that it was *easier* to use soft than cohesive gold, thereby relieving the operator of that extra care which should characterize all dental operations. Such was not my intention. Excellence and the highest degree of perfection must command our first and best efforts.

I wish to answer one or two points attacked by Dr. Harlan, and am sorry he has been called from the room, as it is not always satisfactory to talk behind a man's back. First, it was claimed that I failed to cover the ground in regard to our theories and practices in the field of root-filling. I did state however, that as most of my papers read before this and other societies, had either been upon



or led up to this subject, I felt confident you knew where I stood and any allusion might prove a tiresome recapitulation. Suffice to say I am an advocate of the preparation and filling of roots at one sitting, and up to this time see no reason why I should change. One gentleman stated that he used antiseptics and disinfectants until such time as he knew asepsis had been produced and then filled *temporarily* to await results. If asepsis has been produced the gentleman has done all that the science of our profession enables us to do, and I see no reason for delay. The time and brains you have spent to thoroughly disinfect, cures the disease, you can do this in one hour, you could do no more in twenty.

Dr. Harlan objects to my using a *slightly* escharotic antiseptic in cavities which have required no other treatment and claims it is a fallacious theory for the reason that the tubuli of that tooth may contain micro-organisms, that they would be effectually sealed in by the coagulation and might revolt at any time. Now Dr. Harlan made the statement to you that he was not a man of detail but a generalizer. I think this statement proves it. We know that he is scientific and a more persistent student we have not in the profession, but I fear this remark was made before the second thought. It took Dr. Andrews of Boston, a year ago, before this society some time to prove to your satisfaction that microbes entered the tubuli, even of roots containing a putrescent pulp. I did not know that any authorities, so far, had claimed that they entered the tubuli of a living tooth. I know 'tis claimed that micro-organisms constitute an etiological factor in dental caries, but not directly. Even Dr. Miller is willing to admit that micro-organisms possessing life eat, digest and excrete and that it is only the excretion which generating an acid dissolves the osseous structures, the microbe then finding nourishment in the organic matter, but he has never claimed to find these beyond the cavity of decay in a living tooth. It must be apparent to you that the theory of microbes in the tubuli of a living tooth is extremely fallacious, consequently upon that ground your medicament could do no harm. But it is not for that purpose I use it, it is to stimulate the fibrillæ to action by producing a coagulation of the albuminous substances in the tooth structure and to produce, as it were, a protecting membrane between tooth and filling material, also to neutralize and render inert any small particle of decay that might have been overlooked.

Dr. Crouse opened the discussion on our companion paper, and he and I like to have a tilt on the subject of the medical profession occasionally. Inasmuch as I take the ground that we belong to the army of healers and the Doctor has laid great stress upon this point in his discussion, I may be pardoned for saying a word on this point. He and I can have no fight on the ground of my wanting to merge the dental into the medical profession. I believe we are two separate and distinct organizations. We each have a work to perform, and one is just as separate from the other as it is possible for a blacksmith to be from a tinsmith, still I can but believe that there is no body of men under heaven to whom we as a profession are so much indebted as to the pathologists and chemists who have found their birth in the medical profession.

It is the advance of therapeutics, pathology, physiology, chemistry and micrology that has given us the stand and the advancements we have gained in the last fifteen years. Look over the literature that has brought our profession to its present standing; look for the reasons and causes that have advanced us; look for the brains that have furnished the knowledge required, and you will find among the contributors such men as have taken advantage of what the medical profession affords. They have studied medical science, and, taking all the branches of medicine as a foundation, we are to-day a branch of medicine, separate and distinct in our practice.

Soap, as a dentifrice, I believe to be both beneficial and deleterious, paradoxical as it may seem. Beneficial so far as it possesses alkaline and detergent properties, and so far only. Deleterious on account of its mechanical influence upon the brush, rendering it too soft to produce upon the gingival tissues the proper amount of friction for stimulation, and also deleterious on account of its tendency to produce and nourish chromogenic bacteria. I therefore believe it to be correct to prohibit the use of soap in the mouth until the teeth and gums have received the proper amount of friction from a suitable brush.

DR. WASSALL: I desire to express my satisfaction for the manner in which my paper—and also the one read by my colleague, Dr. Clifford—has been discussed. There are many of you whom I should like very much to have heard, as there were a number of topics that might have been touched upon, but I rise simply to express my

entire satisfaction and thank the society for the way in which it received my paper.

PROFESSOR C. E. SAYRE, D. V. S., gave a short lecture on VETERINARY DENTAL SURGERY AND OPERATIVE DENTISTRY, which was listened to with marked attention.

On motion of Dr. Ottofy, the thanks of the society were tendered to Professor Sayre for his very instructive address.

The Society then adjourned.

#### INTERNATIONAL DENTAL CONGRESS.

*(Continued from page 131).*

M. Trouvé, of Paris, read a paper concerning "Some applications of electricity to dental art."

He makes a comparison between the different motors a dentist can use, and shows the superiority of electric apparati. Most of the criticisms regarding electricity cannot be sustained after electric power is distributed through the streets like gas and water. M. Trouvé showed his galvanic apparatus, whose power is known, also a dynamo-electric machine of his invention capable of being run by hand, giving electricity under all its forms : force, light and heat.

(FINIS.)

#### ODONTOGRAPHIC SOCIETY OF CHICAGO.

Meets second Monday of each month. Programme of essays to be read before the Odontographic Society in March : Prof. E. S. Talbot, "Fallacies of the Old Theories of the Etiology of Irregularities of the Teeth." April—Dr. H. N. Pitt, "Matrices and Separators;" Dr. C. J. Merriman, "Clinical Studies of Caries of the Teeth." May—Prof. G. V. Black, subject to be announced. June—Dr. A. W. Hebert, "Partial Lower Gold Dentures;" Dr. A. W. Rogers, "Dental Medicine," September—Prof. L. L. McArthur, subject to be announced. October—Dr. F. H. Zinn, "The Sixth Year Molar;" Dr. C. E. Bentley, "Tic-Douloureux." November—Prof. L. P. Haskell, "Unsuccessful Dentures." December—Prof. C. P. Pruyn, "When to use Amalgams and when Gold;" Dr. L. D. Henderson, "Amalgams and their Characteristics." Annual meeting.

The Nineteenth Annual Meeting of the Kansas State Dental Association will be held at Topeka, Kan., Tuesday, April 29, continuing four days.



# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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## INTERNATIONAL DENTAL CONGRESS.

The editor of the *Dental Register* under the above heading has a few words to say about the action of the New Jersey Dental Society in reference to an International Dental Congress in 1892. The Chicago Dental Society and three other societies sent an invitation to the Paris Congress, inviting the holding of the next Dental Congress in Chicago, in 1892. This was taken under consideration by the Executive Committee of the first Congress. Now that Chicago will have the World's Fair, the committee of the last Congress can speak about a future Congress with decisiveness.

We are pleased to notice the action of our Eastern brethren in stimulating an enthusiasm in the profession toward this end, as we believe the carrying to a successful issue of so large an undertaking requires the earnest effort of every practitioner throughout the land. A meeting has been called for April 8th at the Hoffman House, New York, to take initiatory steps toward organization, and the various societies have been asked to send delegates to that meeting, but as the majority of the State societies do not convene until a later date, we would suggest that permanent organization be deferred, as the proper place for the matter to come up, is, of course, before the American Dental Association at its next meeting, at Excelsior Springs, Mo. We are confident that the American Dental Association, as the representative body of American Dentists, will at once take measures to complete the work already outlined by the different State and local societies to be represented in New York at the April meeting.

## CHICAGO.

Chicago ! There must be magic in that word. From the time a little village located itself by the lake and said its name was Chicago, there has been a succession of surprises in connection with the place.

One thing after another has brought her prominently before the world, till to-day she is the most renowned city on the continent. The country has come to look upon Chicago as the embodiment of all that is progressive, enterprising and substantial in our modern civilization.

The other day, at the National Capitol, she received another endorsement of the nation's confidence and esteem. In the face of vigorous opposition from three of the most powerful cities in the United States (not to say anything of Cumberland Gap), she secured the honor of having the World's Exposition located at her gates.

This was a tribute from the American people which Chicago never can afford to forget. It was a compliment to her ability, an admission of her greatness, and an advertisement to the world that she is *the* representative American city.

Chicago may well accept with pride the honor conferred upon her ; she may well be grateful for what the nation has done. And she is grateful. She appreciates in full measure the distinction, and invites every American citizen to join with her in making the Exposition the greatest success of the century.

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In this connection it is pleasing to remember, that in the movement which terminated so successfully for the interests of Chicago, her dentists took their proper part.

When the subscription books were opened they came forward with a unanimity which was a credit to them individually and collectively. They proved what concerted action would do, and gave an earnest of their public-spiritedness.

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Now let us see if they will keep up their reputation in this direction. It has been settled that the exposition will be held in Chicago, and at that time we will have in our midst a representation of all the progressive interests of the world.

Shall dentistry be left behind ? It depends greatly on the harmony among the dentists of Chicago whether this be so or not.

Whatever our dentists undertake to do unitedly is always well done. We know nothing of half measures.

The twenty-fifth anniversary of the Chicago Dental Society in February, 1889, was the most successful meeting a local society ever held. May we not eclipse our record in 1892?

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Let us emulate in our profession the spirit of the citizens of Chicago. They have said to the world: "We are going to have an exposition. We will do our best to make it a success, and we invite the co-operation of every son of Adam to the end that this be not merely an American exposition, but in its truest sense a world's exposition."

Let us in turn say to the profession: "We are going to have a dental meeting. We will combine unitedly to make it a success. We invite every honorable member of the profession the world over to the end that this be not merely a national but an international meeting."

We appeal to the honor, the public spirit, and the professional pride of every dentist in Chicago to unite in extending this invitation.

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#### CHICAGO DENTAL SOCIETY.

The twenty-sixth anniversary of the Chicago Dental Society was inaugurated by a clinic held in the rooms of the Chicago College of Dental Surgery, at 9 a.m., February 4th, 1890.

A number of interesting clinics were performed. Dr. W. B. Ames exhibited models and practical cases of porcelain inlay. Dr. C. R. Baker filled some cavities, using cohesive and non-cohesive gold foil in combination. Dr. A. W. Harlan operated for a case of receded gums. This operation consists of an incision made below the free margin of the receded gum, the latter is then pushed up to, or near to, the neck of the tooth, the incision is then packed with an escharotic; after solution of the latter new granulations will fill up the space thus made. Dr. A. E. Matteson a crown of gold and platinum, of which a special feature consisted in the perfect restoration of the contour of the crown. Dr. Garrett Newkirk demonstrated the scientific employment of instruments for the removal of salivary calculus. Dr. J. G. Reid believes that crystalloid gold can be successfully used for the restoration of contour and demonstrated the use of the gold in a cavity of this character. Dr.



J. W. Slonaker extracted a number of teeth, using nitrous oxide for an anæsthetic. Dr. J. J. Whaley made a bridge for a patient, and Dr. J. H. Woolley filled the roots of a tooth with gutta-percha, illustrating his root-canal dryer. Dr. H. A. Costner filled a tooth with gold using the Bonwill mallet. Dr. J. A. Dunn exhibited an Elliott separator and a Dunn hand-matrix. Dr. T. L. Gilmer exhibited a new appliance for drying root-canals with a platinum wire heated by a current of electricity. Dr. C. S. Case, of Jackson, Mich., showed the making of the Angle regulating appliance, exhibiting a number of models of practical cases. An exhibit of dental electric appliances, consisting of engines, hand-pieces, motors, storage batteries, mouth-mirrors, etc., was made by Drs. E. M. S. Fernandez, F. H. Gardiner, T. L. Gilmer, C. P. Pruyn, George W. Whitefield and J. A. Swasey. Messrs. Sharp and Smith exhibited a fine case of veterinary dental instruments, and Dr. C. E. Sayre equine maxillæ, and specimens of malformed teeth, odontomes, etc., from the lower animals.

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#### DR. RHEIN AND THE NEW JERSEY STATE DENTAL SOCIETY.

In the September (1889) number of the DENTAL REVIEW, we published a paper on "Chloride of Methyl," by Dr. M. L. Rhein, of New York. This paper, it seems, has had an eventful history. The author read it before the New Jersey State Dental Society in July, last, and through his own action and that of the executive committee of the society, it was not published in their proceedings or in their official organ. After revising the paper it was offered to the American Dental Association, but having been read elsewhere, according to the standing rule of the Association, it could not be re-read as an original paper. We then accepted it and it was published. This raised a storm of remonstrance from the New Jersey gentlemen, which caused an investigation on our part of the whole history of the paper. As we understand the matter, we are accused of offering an affront to the members of the N. J. S. Dental Society in allowing the paper to see the light of day in our columns. The author states that he had a perfect right to use the paper for publication, and we granted him that privilege. So we are to blame for the whole matter. We had no intention of affronting the New Jersey Dental Society or any of its members, and we could not undertake to wage a war on the author when he had not injured us in

the matter. A misunderstanding and an unfortunate difference of opinion having arisen between the author of the paper and the society caused all the trouble, and we suppose their differences cannot be healed, so we offer this explanation to the society and the author for the part we have had in the matter, and hope the members of the society and the author will understand that in the advancement of dental science, and have no time or we have no feeling about it either way. We are interested inclination to enter into disputes between members of the profession in any part of the world. The life of an editor is so filled with things that harass him from time to time, that such occurrences as this only serve to make him regret that he cannot please every one; but he does the best he can, and you are requested to (mentally) "put yourself in his place."

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#### THE PROGRESS OF DENTISTRY AND ITS RELATION TO THE WORLD'S EXPOSITION.

It has become a custom to embrace the opportunities offered by international expositions, to bring together for mutual improvement the representatives of various professions and trades of the world. The World's Expositions held since the great London Exposition of 1851 have served as standards of measurement of the progress of various commercial, manufacturing and professional interests of the world. The progress made in many branches of trade, mining and industry, has become known and appreciated by the general masses only as that progress was demonstrated from time to time at these magnificent displays of the last forty years. It has been the privilege of the dental profession only once during its lifetime to be one of this great army to pass in review and submit to an estimation of its progress, and it now behooves us to excel the splendid record made at Paris in 1889. When the unbiased historian of the future records the events of the past, the scientific progress of dentistry will date from the FIRST INTERNATIONAL DENTAL CONGRESS.

The DENTAL REVIEW is now in favor of a SECOND INTERNATIONAL DENTAL CONGRESS, to be held in Chicago, at the World's Exposition in 1892 (or 1893). We have predicted\* that the World's Exposition would be held in Chicago; this part of our prediction is

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\*See page 141, DENTAL REVIEW, March, 1888.

fulfilled, but we also predicted\* that a Second International Dental Congress would be held at the same time and place.

Now we wish to see this prediction also fulfilled. The reader of the DENTAL REVIEW will kindly indulge us in this line of prophecy. Other dental journals have made prophecies. While the favorable reports in reference to the First International Dental Congress were coming in, one journal took marked interest in the Brown-Sequard theory of the elixir of life† and predicted the possibility of a valuable discovery, and, indeed, we find it now recorded that the hydrochlorate of spermine has actually been discovered and placed on the market,‡ much to the comfort and happiness of sterile humanity.

Now that the interest of the profession centers in a Second International Dental Congress, can we not confidently look forward to even further progress with the elixir of life? May not—who can fathom the future—properly administered potions of some elixir lead to a wonderful increase of family, while the *pater familias* may be following the paths of industry a thousand miles away?

We now repeat our invitation to those who are in power and control, that they call the Second International Dental Congress to meet at the Auditorium, in Chicago, at the time of the World's Exposition. In view of the possibilities and in view of recent developments, the slurring references made in the past of a possible meeting of dentists in the Auditorium seems humiliating, to say the least.

The DENTAL REVIEW renounces all imputation of any desire or intention to interfere with the success of the dental section of the Tenth International Medical Congress to be held in Berlin next August. It firmly declares that it will not place anything in the way of the success of the Dental section of the Eleventh International Medical Congress, whether to be held in St. Petersburg in 1892 (as is possible), or in Chicago in 1892 or 1893 (as is probable).

The DENTAL REVIEW is in the field and in favor of the greatest meeting of dentists in 1892 (or 1893) that the world has ever seen. Nor do we mean that the Dental profession will be the tail of any medical kite, as in 1887 at Washington. We propose the convocation of representatives of dentistry, pure unadulterated dentistry.

\* *Ibid.* † *International Dental Journal*, October, 1889, p. 622.

‡ *International Dental Journal*, February, 1890.



from all parts of the world, in the interests of the unification of independent dentistry. It is the intention of the DENTAL REVIEW boldly, fearlessly and openly to fight every coalition that has in view anything whatsoever, by whomsoever instituted, except it have branded upon its forehead the stamp of pure, free, liberal DENTISTRY. In this determination we confidently bespeak the support of *the* dental profession of the United States—the birthplace and home of dentistry.

Dentistry is, for all practical purposes, independent, and we do not propose to see the great army of intelligent dentists of the United States, gobbled up by any octopus of medical or any other class of professional men without making a protest.

There is no time for delay; conservative journalism may be admired, but it is too slow for the present. The adage, “better late than never” as practiced \* last summer when the success of the First International Dental Congress was assured, was well enough for 1889, but it will not do for 1892. No luke-warm, half-hearted support of any journal will do. Those who do not outspoken and frankly favor a great practical and scientific meeting of *dentists* in 1892 or 1893—whatever year Congress decides that the World's Exposition shall be held—must be considered in opposition to it.

Neither will it do next August to say: “Oh, this thing is all in opposition to our dental section in the Eleventh International Medical Congress at St. Petersburg or Chicago” in 1892 or 1893 as the case may be. We are on the ground *now*, to remain until success has crowned our efforts.

There are two things to be done: *First*, the American and Southern Dental Associations should take permanent steps at their meetings this summer, and in all probability the committee appointed by the First International Dental Congress, will coincide with the wishes of these associations.

The fact that the friends of the late International Dental Congress were silent at Saratoga in August last, rather than to take up the valuable time of the association unnecessarily, need not be taken as an indication that they will be silent at Excelsior Springs this year. We confidently believe that the American Dental Association next August will declare in favor of a purely dental meeting for 1892 (or 1893) in the face of cablegrams which may emanate

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\* *International Dental Journal*, June, 1889, p. 374.

from Berlin (where the dental section of the International Medical Congress will be in session at that time), announcing the fact that the Eleventh International Medical Congress will be held in Chicago, and that a dental section will positively be a part of that congress.

*Second.* The dental societies of Chicago, always in love with each other, will now be—even as they are at this writing—more and more united, and when the time comes they will welcome and entertain the representatives of the dental profession in a manner commensurate with the importance of the Western Metropolis. When the last hours of 1892 (or 1893) have faded away, there will have passed into history a year that will forever shine as the brightest of many in the constellation of dentistry.

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#### DR. CATCHING.

Dr. B. H. Catching, the editor of the *Southern Dental Journal* from the initial issue, has retired from the *Southern* to take up the work of making *Catching's Compendium of Practical Dentistry* a success. Instead of taking the routine work of daily practice as all-sufficient for the future, he enters a new field, in which we wish him abundant success. The new editor, Dr. H. H. Johnson, enters very modestly into the ranks, outlining a policy which we trust will guide him and the *Journal* to deserved position and enlarged usefulness.

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### DOMESTIC CORRESPONDENCE.

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#### SECOND INTERNATIONAL DENTAL CONGRESS.

*To the Editor of the Dental Review :*

*Dear Sir :*—The site for the location of the World's Exposition of 1892 having been selected, has not the time arrived for the members of the dental profession in our country, and particularly in the city of Chicago, to inaugurate proceedings to arrange for the Second International Dental Congress? As a member of the First International Dental Congress, I heard with profound pleasure the enthusiastic endorsement of the motion there put "to continue the holding of Dental Congresses." And while the time and place for holding the next Congress was not absolutely determined, the matter was delegated to a special committee with the general understanding that the Congress would be held coincidentally, as

to time and place, with the World's Exposition of 1892. The second congress has been invited to convene in the city of Chicago at that time, and since every worthy member of our profession will wish the work so splendidly inaugurated by France in 1889 enlarged and made more glorious by America in 1892, we should begin at once to take such preliminary action as shall result in securing for us a Congress that will be a credit to the energy and power of the profession in America, and a source of gratification scientifically and socially, to the attending delegates from every clime.

I look upon such an event as something more than simply a meeting of dentist with dentist. It appears to me a golden opportunity for the profession at large to enter upon a more exalted position before the world than it has yet enjoyed.

Then without 'isms or 'ites, free from petty jealousy and sectional animosity, with prodigal liberality of the individual for the conservation and benefaction of the cause he has espoused, let the work be pushed with vigor on to victory.

ELECTUS B. WARD, M. D., D. D. S.

CHICAGO, March 3, 1890.

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#### LETTER FROM NEW YORK.

ANNIVERSARY MEETING OF THE FIRST DISTRICT SOCIETY. THE CALL FOR AN INTERNATIONAL DENTAL CONGRESS, SENT OUT BY THE STATE SOCIETY OF NEW JERSEY.

*To the Editor of the Dental Review:*

DEAR SIR: I promised you a *resume* of the clinics and meetings of the First District Society in time for the February number, but was unavoidably prevented. As a full report of the clinics has appeared in the regular organ of the Society, it would seem unnecessary to give it here. I shall therefore mention only those of the clinics which to me seemed worthy of more extended notice than the mere mention given in the report.

Two clinics in my humble opinion stand out pre-eminently, the one in its relation to prosthetic and the other to operative dentistry. In the report on practice which I gave to our State society last May I pointed out a glaring fault in bridge work, which it seemed to be the duty of the profession to remedy at once. By almost any good method of construction, the bridge in position offers an ominous appearance when the patient has succeeded in breaking off a porcelain face "chewing soup," or "biting ice cream." In compari-



son with other service the bridge worker's fee is large, not to say excessive. Persons who can afford the luxury, are rich enough to travel, and not infrequently visit the metropolis. Thus we in this section see more than our share of broken bridges. If the piece were readily detached, a tooth could be replaced for from five to ten dollars, as circumstances indicated. But if an hour must be spent in partly destroying the attachments, and that amount of extra repair must be done before the piece can be replaced, the affair is different. The fee must be greater; yet, notice, that the benefit to the patient is the same in either instance. Dr. F. T. Van Woert of Brooklyn has solved the problem. His method is as follows: The tooth chosen must have the pins longitudinally placed. To these a piece of Gib wire (drawn triangularly in shape) is riveted, the apex of the triangle towards the tooth. With an instrument of his invention a dovetail, which exactly fits over this wire, is made in the platinum to be used as a backing. The tooth being slid into the slot thus made, is fitted to whatever form of root attachment the operator chooses, and waxed into suitable position. The tooth is then removed and the backing and pivot attachment invested and soldered together. Thus is produced a crown with a removable porcelain face, which is eventually held in position with cement. In the construction of large pieces, two sets of teeth should be fitted into position, one set being cemented to the bridge and the duplicate given to the patient. Thus at any time a tooth could be replaced by any dentist in half an hour. Or where no duplicates are made the operation could be as quickly done by any dentist acquainted with the method.

The other clinic of importance was Dr. Harlan's. I do not think I have ever learned as much in one hour as I did at his chair. He demonstrated the effects of the drugs commonly used by us in tooth roots, and proved beyond a doubt their deleterious influences through their power to coagulate albumen.

One may turn the pages of the journals for the past twenty years, and whenever he finds the treatment of roots under consideration, he will observe the same system of argument offered. Each speaker dogmatically stigmatizes his neighbor as in the wrong path, and then reports marvelous success with his own method. If the matter of compilation were tried, each drug would show about as many advocates as objectors. The men on neither side give adequate reason for their practice or denunciation, be-

yond the dogma "I use carbolic acid because I get good results, and besides, my grandfather used it," or perhaps it may be "I do not use iodoform because it stinks, and my grandfather got along without it anyway."

In the light of the past then, Dr. Harlan's method is refreshing. He says: "Gentlemen, I do not use any drug which will coagulate albumen in a tooth canal, because I thereby produce a foreign body which bars my further progress in cleansing, and which I cannot remove, since it extends into the canaliculi." Then he takes all the drugs commonly used for root treatment, and pouring a few drops on egg albumen in a test tube, demonstrates that his denunciation is well based. Next he shows how the essential oils do not produce this mischief, and thus taking away our old but dangerous friend, he introduces us to a better. When I am next invited to give a clinic I propose to repeat this one because I think it teaches so much.

Now let me pass to newer news. New Jersey has decided to have a Dental Congress, International, of course. As I understand it, it is to be held wherever the World's Fair is held. At the time the call went out for the co-operation of dental societies all over the country, undoubtedly New Jersey thought the great fair would be in New York, and of course it would be doubly pleasant to have a dental congress right at her doors. But there is nothing mean about the Jersey "boys" (we call them boys because they never grow too old to work energetically at any enterprise.) They will keep their shoulders at the wheel, even though they roll it westward. Therefore, if you gentlemen in Chicago find yourselves embarrassed with the work of holding a World's Fair, you need not worry about the Congress. The Jersey boys will get it up, collect the delegations together, and ship them to you at the appointed date, boxed and labeled, so that you will only need to arrange a hall to hold the Congress in and a place where the foreigners can sleep. The Jersey boys will take care of themselves. They never sleep, at least not at night.

The call is for State and local societies to send delegates to the preliminary meeting at the Hoffman House, New York, Tuesday, April 8th, at 2 p. m. The societies in this section have appointed delegations of five; therefore, it would be well if other societies should send the same number. I presume that if the Western Societies wish a voice in this meeting and do not find it convenient

to send men, they might appoint proxies with instructions as to their wishes. Perhaps a single man here would be admitted and allowed five votes as a proxy from a distant city. I merely throw this out as a hint.

The following is the working plan of the congress which will be offered for consideration by the meeting at the Hoffman House.

“General: Each State in the United States through its Societies to send delegates and to be allowed twenty votes each. The delegates assembled to elect from among their number a permanent president, vice-president, secretary, treasurer, and an executive committee of fifty members, to be divided into sub-committees of finance, subscriptions, essays, transportation, accomodations, legislation and other committees necessary in perfecting plans.”

“States. Each State, and local societies in the State to appoint general State committees of as many members as may be needed, said State committees to elect a working executive committee of twenty members who shall elect a president, secretary and treasurer, and said committee shall canvass their respective States for subscriptions, papers and exhibits, and they shall be the total number of delegates allowed each State in the general congress committee.”

Should any societies act on my suggestion and appoint proxies in this section to be present at the Hoffman House meeting, it would be well for them to instruct their delegates on their wishes in regard to this plan.

The above plan seems excellent, and comprehensive as far as it goes, but does it not sound like a plan for a National rather than an International gathering? In a truly International congress foreign societies should have a distinct voice. I offer the following plan for consideration.

“Foreign: The representative organizations of Great Britain, France, Germany, Austria and Italy, shall each appoint a working committee of ten. Collectively these committees aggregating fifty shall be known as the European Executive Committee. They shall appoint their own officers, take subscriptions, obtain essays, clinicians and exhibits, and thoroughly systematize the foreign portion of the programme, submitting the same to the home executive for final adjudication. Separately the committees of ten shall act in their respective countries similarly to the State committees at home. Smaller countries not mentioned above must be granted an equable



representation on the committee of the country nearest, should application be made.

The congress when in session should be controlled as to general conduct by the joint action of both executive committees.

Should it be feasible the South American countries should be allowed similar representation and management."

From criticisms which have already appeared in the journals it is plain that opposition will come from those who prefer to consider dentistry as a specialty of medicine (yet who always say "our profession") and they will attempt to hide behind a blind proclaiming that the Congress if held should emanate with the American or Southern Association. That cry may as well be answered at once. The Jersey boys have declared themselves. They merely wish to give the movement an impetus so that these two large associations will be compelled to take notice of the matter at their next meetings, and not shirk it as they did last year.

If the societies throughout the country will coöperate the Congress can be an assured fact by the time these associations meet; so much so that they will be only too glad to take hold, and afterward look back with pride and say, "Gentlemen, see what we have done!" New Jersey will be forgotten then, but they will have been the power behind the throne, nevertheless. On the other hand wait for either of these associations to move, and we may have a Congress about the time when Bellamy's millenium is due. That is what the specialty of medicine men know, and that is why they make this cry about New Jersey being premature.

The editor of the *Cosmos* says: "The coming session of the International Medical Congress, with its dental section at Berlin, will afford another opportunity for an interchange of opinion regarding the antagonistic propositions of coöperation of dentists as specialists with the Medical Congress, or a distinct and purely dental organization. *One plan or the other will necessarily have to be abandoned. It would be impracticable to profitably continue both.*" (Italics mine.)

This argument is not logical. If it were then we should abandon our national body, because we already have representation by section in the Medical National Body. We should disrupt our American Dental Association, because we are accorded the distinguished privilege of sending delegates to the American Medical Association. And by the way, which is the most profitable to us—

own our own national body, or our little section in the Medical Association.

I heard yesterday that when the news reached Chicago that Congress had voted them the Fair, the citizens laughed so loudly that they shook the fillings out of their teeth. If that is true the dentists in your section should make enough money now to invite us all out West for a week at the World's Fair.

RODRIGUES OTTOLENGUI, M. D. S.

115 MADISON AVE., N. Y., March 3, 1890.

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## FOREIGN CORRESPONDENCE.

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### LETTER FROM LONDON.

*To the Editor of the Dental Review:*

SIR—When so many young men in the United States are about completing their technical studies, as prescribed in the curriculum of the various institutions of that country, and are preparing to enter the ranks of the dental profession, we cannot help but inquire if the colleges have done the best possible for the men who are to go to the public and offer their services for what they may command.

While in many cases the course of study leaves little to be desired, the practical work might be vastly improved upon.

The advocates of a thorough technical education have the satisfaction of seeing much advancement made in this direction, in the lengthening of the college course from the five months' term, which always was too short—except for the constitutionally tired student and the equally indifferent instructor—to the nine months' course, and the requiring three of these ere the student can come up for his final examination, as now advocated by a very few of the leading dental colleges in America, and is an advance that all other institutions must follow, or the public will soon discriminate to the disadvantage of those seeking degrees from colleges that, as dental schools, exist only in name and not in deed. The slipshod methods incidental to many institutions in the Eastern States have caused American dental degrees to be looked at askance, and their possessors here to be tabooed by those who admire thoroughness and honesty, especially in connection with a profession which has so successfully fought its way through the Stygian darkness of the

rankest empiricism to the broad plane of its present position in the world of science and art.

And while the fact remains that Eastern colleges have been very much at fault in not always meting out even-handed justice, the Western institutions have some deep scars of the same kind that will only heal by the slowest possible process of granulation, and it is to the alumni of the various colleges, who have an abiding interest in the welfare of their profession, to see to it that their alma mater represent and live up to a standard that leaves as little as possible to be desired.

The association of dental faculties is a good thing, and while it is a positive advantage to the profession, insuring as it does a fraternal feeling and auguring well for the most thorough adoption of an unific standard of requirements; I cannot help but think the potency of its influence might be accentuated by practical endorsement that might be afforded it by State societies insisting upon requirements even in advance of those now exacted. It might probably be suggested that the existence of dental laws in the different States is the best argument that the requirements of the case has been met. In many States the *laws* are good enough, but their mode of application cause them to be looked upon as a farce. This in many instances is owing to the axe-grinding proclivities of parties interested in endowed institutions, or dental educational stock companies; whereas, if dental colleges were State institutions, the atmosphere in their vicinity would be much more pure than it now is, and the profession would then view in a different manner proceedings which now are winked at, if noticed at all.

Of necessity all systems are fallible, and of many changes that might be suggested, few probably would stand the test of time, yet I firmly believe many dental students might be more practically equipped for active practice, by utilizing their senior course in the operating room in a manner that would cause their public practice to be but a continuation of their college experience.

Some colleges have boasted of the number of their extractions, others of the pounds of amalgam used, while others pose as gold manipulators entirely. Any hobby, no matter how well ridden, will sooner or later land its rider in a ditch, and, as a rule it isn't glory he is covered with when he emerges therefrom. Would it not therefore be better to pursue a rational course and treat cases



upon their merits, thereby assisting the students to form intelligent opinions as to the requirements of the cases that come before them, and to treat them accordingly, instead of in a stereotyped manner, irrespective of condition, surroundings or ultimate results.

A system might be arranged and developed where students, during their senior course, could take patients, and after a thorough examination of the cases, tabulate the work to be done, and arrange in their own minds the course of treatment to be pursued, backed up by reasons for said treatment; this to be submitted to the demonstrator or professor in charge of the operating room, by whom the cases could be re-examined, and if any error of judgment appear on the part of the students, they could easily be corrected and the requirements of the case be explained in the most satisfactory manner possible ; and these cases being examined at their completion by the instructor, could be with much consistency included in the final examination of students, and would, I think, produce much better results than where students are required to produce for examination, a mouth containing a certain number of gold fillings, which most frequently results in the students doing anything but the best for their patients, to say nothing of best conserving their own time and energies, and not infrequently furnishing a sad commentary upon their own reasoning capacities and that of their instructors.

Any one who has any knowledge of college work, must be fully aware of the time taken by students to bring their examination work to the degree of perfection that will insure its passing the final tests; time all out of proportion to that they ever expect or would be willing to devote to work in actual practice. This is the reason I believe that we find so few good operators. They seem to think they should rest content with what they have done, instead of seeing how much better they might do ; a state of affairs brought about by the failure to introduce into their work a fair admixture of brains, a procedure which would at once open up a new field to their professional vision, and one that would prove such an element of professional strength, that even the most sanguine would contemplate as visionary, were it not for its reality. Another element might not be unworthy the consideration of dental instructors, more especially those connected with the operating rooms ; *i. e.*, the reception, treatment and dismissal of patients. As far as I have been able to observe, either in England or the United States, but little,

if any attention, has been given to this very important factor in ultimate success.

Hospital patients in all large cities are derived principally from the poorer and middle classes, but this is no reason why they should be treated as cattle, and have but little if any respect shown for their feelings and physical sensibilities, as is too often the case, especially at places "supported by voluntary contributions," at which places we not infrequently find humanitarianism, and gentlemanly attributes maintained in even a still less meager manner. Of course it is difficult to become interested in a person who is not interested in himself, but if students could only appreciate the influence their hospital practice and manners have upon their future work, they would endeavor to be gentlemen at all times, instead of doing as many do later on in practice, when, by their cringing servility to those whom they are led to look upon as their superiors, they display a moral and mental impecuniosity that at once indicates their true level.

Another item for the consideration of the powers that be, and one that would go far toward establishing in the mind of the profession that the Association of Dental Faculties is not a society for mutual felicitation, but a thoroughly wide-awake organization, would be a proposition by the dental teachers of the United States to recommend the passing in all States where dental laws already exist, an amendment to the same, giving power to Dental Colleges to rescind the degrees conferred by them, and to recover diplomas held by any of their graduates who may be guilty of an infraction of the code of ethics of the State societies of said States, and to permanently erase the name of delinquents from the alumni list of their college of graduation.

The necessity of State societies to demand such a measure as this possesses a triple value. First there must be a demand before the supply is forthcoming. Secondly, we shall then see what society has the most moral backbone and desire for professional advancement; and thirdly, we shall also be able to see whether limited liability dental educational companies or State institutions are the best conservers of the dental educational interests of the country. Powers such as these, if judicially vested and applied, would prove of untold value to the profession everywhere; weeding out as it would the renegades of the profession, and we should not have as much charlatanism as is now too painfully evident on both

sides of the Atlantic; for the public would thereby be enabled to discriminate between respectable practitioners and the wily "Cheap Jack" mountebanks; some choice specimens of the latter variety having been here lately, sending out hand-bills and advertising as exponents of the very latest in American dentistry; and after giving instructions for whatever fee they could arrange, and writing out testimonials, in which they glowingly depict the advantages of the £10 course which their pupil has taken, wander back to the United States, to be welcomed by outstretched arms by the leading dental society of New York as clinicians, notwithstanding the outrage they have perpetrated upon the ethics of said society, to say nothing of the unblushing manner in which they degraded the profession; which in their sordid ignorance they imagined they were benefiting. These are the kind of men that can stay at home to advantage, and whose occasional advent in England does more harm than years of thorough, legitimate effort will neutralize.

And while the public here are frequently misled by the chicanery of this class of persons, the profession soon relegates them to the ranks of the oblique Jew and advertising shyster, a place which by nature they are eminently adapted to fill.

Yours truly,

W. MITCHELL.

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## REVIEWS AND ABSTRACTS.

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### FOREIGN BODY IN ŒSOPHAGUS—ŒSOPHAGOTOMY—RECOVERY.

UNDER THE CARE OF LACHLAN M'FARLANE, M. D., IN TORONTO GENERAL HOSPITAL.

F. L., æt. 23, moulder.

The history of the case is as follows: On November 30th, at nine o'clock in the morning, while at work, he somewhat hurriedly took a drink of water. While swallowing the water a plate with an artificial tooth attached became dislodged from the roof of his mouth; the first intimation he had of the dislodgement of the plate was that immediately after swallowing the water he felt something sticking in his throat, and at the same time observed that the plate was no longer in the roof of his mouth. He went immediately to a doctor, who, with the assistance of another practitioner, passed an umbrella probang, but did not succeed in doing any good. Dr. McDonagh then saw the patient; he examined with the laryngo-



scope, but failed to discover anything abnormal; a probang with a bulbous extremity was then passed into the stomach, and during withdrawal a foreign body was detected at a certain point; a grating sensation was felt. Located by measurement, it was eight and a quarter inches from the upper incisor teeth, or two inches from the upper limit of the œsophagus.

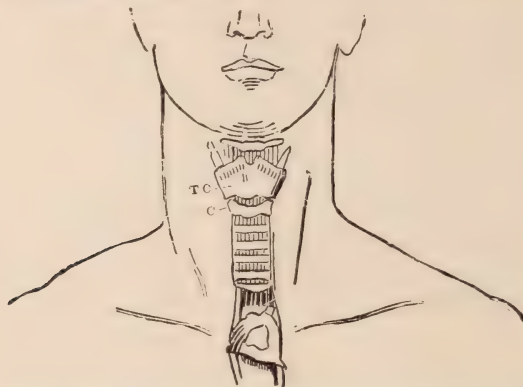


Fig. 1. The position which the foreign body occupied in the œsophagus is indicated. The cartilages of the larynx are outlined, and a portion of the trachea represented. The œsophagus, at the point where the foreign body was lodged, lies immediately behind the trachea and slightly to the left of the middle line. The line to the left of the windpipe indicates the direction of the incision.

Œsophageal forceps of various kinds were introduced into the gullet; during one of these attempts the foreign body was siezed, but the patient grasped the doctor's hand and forced him to relinquish his hold; all subsequent efforts to seize the body with forceps were unsuccessful. The operation of œsophagotomy was undertaken fifty-three hours after the patient had swallowed the plate. The wound made was explored with the finger, and at the lower angle a foreign body was detected lying in the gullet; this was distinctly felt and was apparently fixed in position. A scalpel was introduced and an incision made into the œsophagus, cutting down upon the foreign body, and by this means an opening was made a little more than an inch in length; the tooth was then felt projecting into the lower angle of the wound; this was seized and some traction made upon it, but the plate was not dislodged; the plate was then grasped by its superior margin and rotated on its antero-posterior axis, so that little by little it was rolled out from its position.

On December 28 patient was discharged from the hospital. He had no inconvenience whatever in swallowing his food, and the wound in the neck was almost completely cicatrized.

For notes of this case we are indebted to H. A. Turner, resident surgeon at the hospital.

*Remarks:* Œsophagotomy was undoubtedly called for as the only means of obtaining relief for the patient. There was no difficulty encountered during the operation. There were no important structures divided, and the bleeding, which was insignificant, was easily controlled. It was not thought advisable to suture the opening in the œsophagus. The plate had been fifty-three hours in the gullet and was firmly impacted, so that probably some extent of damage had been done to the œsophageal wall, and it was consequently thought safer to leave it open.



Fig. 2. Plate with attached tooth.

During the subsequent history of the case, the most noteworthy point is the way in which the act of swallowing could never be completed without forcing out the contents of the gullet into the wound. It was attempted at one time to pass a stomach-tube and so to feed the patient; but he resented the attempt so strongly that the thing was abandoned as impossible. For a time he was allowed soft food by the mouth, the enemata being stopped, but invariably some of it came through the wound. On the fifteenth day after the operation the nutritive enemata were resumed and for three days he had absolutely nothing by the mouth. The wound gave no further trouble, and a complete cure resulted.—*The Canadian Practitioner*.

A PRACTICAL TREATISE ON ARTIFICIAL CROWN AND BRIDGEWORK, by George Evans. Second edition, revised and enlarged, with 547 illustrations. Philadelphia: The S. S. White Dental Mfg. Co.

The prompt issue of the second edition of this work is a sign of the great interest with which this subject is regarded by the profession. It carries out very well its purport to be a practical

treatise. This, however, does not interfere with an excellent consideration of the scientific principles involved in the preparation of roots and teeth which are to serve for the attachment of artificial crowns or as piers for bridges. The plan of treatment recommended for pulpless teeth, is in the main trustworthy. In enumerating the lesions of the pulp which require its extirpation, the author is hardly radical enough considering the serious consequences which follow pulp death in teeth which are carrying bridges.

Chapter II treats of the devitalization of the pulp. Under this head we are again subjected to a description with all its horrible details of the brutal or so-called instantaneous method which consists in the excision of the crown on the driving in of a wooden peg. The only benefit as yet conferred on the dental profession by the International Tooth Crown Co., is in having this operation patented. Valueless though this patent may be, it is a blessing in so far as it discourages a barbarism.

While in the main the treatment recommended for pulpless teeth may be safely followed, it leaves room for honest difference of opinion. For instance many are opposed to the enlargement of root canals with drills. The author has let slip a magnificent opportunity to teach a lesson in utterly failing to impress his reader with the necessity of adjusting the rubber-dam to the teeth under treatment. Science of Mycology and Antisepsis has made this rule imperative. The author does not take cognizance of the fact, that carbolic acid is a coagulator of the organic elements of dentine, and therefore should be excluded from root canals, because its action would prevent the absorption of the diffusible antiseptics. In this connection it would have added great value to the book to have mentioned that the essential oils are invaluable in these cases.

The method advised for root canal filling is above criticism. The greater portion of the book is devoted to a setting forth of the numerous methods and systems for making crowns and bridges. These are explained with great impartiality by both text and illustration, albeit certain appliances are displayed in a manner more to advantage the dealer therein than to subserve the purpose of a text book. Many of these processes have been tried only to be abandoned, and while there may be some merit in each, it hardly seems commendable to inveigle others into the expenditure of time and money necessary to a trial.



The portion of the book devoted to bridgework is a convincing plea for the value of this kind of denture. It remains unchanged in this second edition except in some minor particulars. A valuable chapter is introduced upon the hygienic condition of the mouth as affected by bridge work.

Chapter VI. which treats of a combination of crowns, bridges and plates is incomplete in that it fails to notice Dr. Gartrell's (Penzance, Eng.,) excellent system. The proof readers' and printers' work leaves little to be desired and it is a book that should be read by all who would be posted on this—the latest and most helpful procedure of modern dental practices.

#### PAMPHLETS RECEIVED.

Proceedings of the National Association of Dental Faculties, Saratoga, August, 1889. John S. Marshall, Secretary, Chicago.

Eighth Annual Report of the Illinois State Board of Dental Examiners, 1889. C. Stoddard Smith, Secretary, Chicago.

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#### MEMORANDA.

Where did you get that—crown?

Dr. J. H. Spaulding, of Paris, paid us a flying visit recently.

Dr. T. E. Weeks was in Chicago in February on a short visit.

You must not fail to take in Kansas City when you go to Excelsior Springs next summer.

Dr. J. E. Keefe of this city, accidentally shot himself through the hand, while cleaning a revolver.

Beginning with the January, 1890, number of *The Dental Record* the familiar name of its late editor disappeared from the cover.

The name of the editor of the *Dental Record* has been missing from the cover since the December issue. Wonder who the new editor may be?

The World's Fair—well, its coming—so. At Excelsior Springs the committee of—say fifteen—can begin to make preparations for the CONGRESS of 1892.

An Anæsthetic Club of Chicago, has been organized, with Geo. Leninger, M. D. President and P. J. Cigrand, D. D. S., Secretary. Meetings are held once a month. Next!

From month to month we note the continued excellence of the selections and paragraphings of our confrere, Hungerford, of the *Western Dental Journal*. "Industry, sobriety and judgment."

We will undertake to secure hotel accommodations for August, 1892, if you will only forward applications in due time. First come, first served, Baths extra. No charge for electric lights or registration at hotels!

At the late meeting of the Chicago Dental Society, at the Clinic, there was an "exhibit of dental electric appliances, consisting of motors, engines, mallets, sluggers, etc."—At least so one of the daily papers has it.

The seventh annual meeting of the Minnesota State Dental Association will be held in Minneapolis, Minn., July 11, 12 and 13th. The executive committee are arranging a programme and an interesting session is confidently predicted.

American and European Dental College at Chicago; to practice dental and oral surgery; incorporators, J. G. Lunn, J. H. Lee, A. Valentine. Whew! When will this thing stop! How many more dental colleges are we to have on paper!

It is said that some dentists always charge their patients for any instrument broken during operations on the teeth of the latter, especially if the piece broken cannot be recovered. *En Passant*, perhaps this is the principal service rendered to the patient.

In Indianapolis a short time ago they adopted standard time. That's the reason Drs. Morrison and Jameson got in one day late for the Chicago Anniversary meeting. They'll be here on time for the International Dental Congress in 1892, just the same.

Synthetic carbolic acid may be obtained of Eimer & Amend, New York, cor. Third Avenue and Eighteenth streets. It does not melt at 98 F., is more soluble in water than that distilled from coal tar and is free from the empyreumatic odors that so frequently cling to the distillate.

The Chicago Dental club was addressed by Dr. W. X. Sudduth, of Philadelphia, the evening of the 24th of February. Subject, Histology. There was a lantern exhibit, and a general good time was had, including a dinner. The proceedings are to be published in the *International Dental Journal* from this date.

"I suppose," said the well-preserved old beau as he took his seat in the dentist's chair, "that a man's teeth at 35 begin to show some signs of age and wear, and it is time I was having mine looked at."

"You are right, sir," replied the man of forceps as he examined them. "Yours should have been looked at about twenty years ago."

This instructive little story teaches that it is of no use to try to deceive an expert.

Dr. Truman W. Brophy has returned from a long sojourn in the far West fully restored to health. He was entertained at Kinsley's on Friday evening, February 28, by a few friends, among whom we noticed Drs. Cushing, Swain, Gardiner, Ward, Ames, Noyes, Wassall, Swasey and Harlan. Dr. Swain delivered a neat little address of welcome which was feelingly responded to by the guest of the evening after which brief speeches were made by every one present, testifying their pleasure at seeing Dr. Brophy again in our midst looking so well and in such excellent spirits.

MR. EDITOR: As it is practically settled that Chicago will be the site of the World's fair in 1892, I should like to know if some measure cannot be taken to agitate the question of holding an International Dental Congress at Chicago sometime during the fair.

Being one of the so-called country dentists it has occurred to me that it would be advisable to suggest that such a congress be held in Chicago at that time. There being many reasons why a congress held during this time would be very beneficial to many members of the dental profession.

Many of our profession will no doubt attend the Fair and would be delighted with the idea of also being able to attend a Dental Congress.

Therefore, Mr. Editor, it does seem, when we think of the great advantages which may be gained by having such a congress, that we cannot afford to allow such an opportunity to pass by unheeded.

I close this hoping I may have the pleasure of meeting you at the International Dental Congress to be held at Chicago in 1892. Resp'y, SIDNEY.

## ILLINOIS STATE DENTAL SOCIETY.

The twenty-sixth annual meeting of the Illinois State Dental Society will be held at Springfield, beginning Tuesday, May 13th, and continuing four days.

GARRETT NEWKIRK, Sec'y.

## A CHILLY CALL.

The Editor—"Take that chair, Miss Bosting."

Miss Bosting (with a roll of MSS.)—"Thank you, I will not take the chair; but I shall be glad to occupy it while I read you my poem on icicles."—*Time*.

## PLUCKING VICTORY FROM DEFEAT.

Mother—"Why Johnnie! What on earth have you been doing?"

Johnnie—"Fight'n'. 'N', say, you owe me half a dollar on it. Know that tooth you was goin' to pay a feller to jerk?"

"Yes."

"Well, Billy Biffer knocked 'er out. '—*Exchange*.

## AFTER LISTENING TO AN ESSAY AT THE FIRST DISTRICT DENTAL SOCIETY.

QUESTION;—"Why don't we say: 'We physicians practicing dentistry,' instead of dentists 'practicing a specialty of medicine?'"

ANSWER.—"Ask an easy one." An oculist never says: "We oculists practicing a specialty of medicine." He says: "Physicians practicing a specialty." "They are always M. D.'s and that makes a heap of difference."

At this point the lights went out and the interlocutor also.

## KILLED BY CHLOROFORM.

## TWO WOMEN EXPIRE AFTER ADMINISTRATION OF THE ANESTHETIC BY PHYSICIANS.

DUBUQUE, Iowa, Feb. 15.—Mrs. William L. Bradley, wife of one of the leading capitalists and real estate owners of Dubuque, tripped on a door mat this afternoon while coming out of a neighbor's house and fell heavily to the pavement. Her right arm was broken by the fall. Dr. Horr was summoned and administered chloroform preparatory to joining the broken member. Mrs. Bradley fainted and expired a few moments later. The doctor is strongly censured. He claims the death of Mrs. Bradley was due to the slipping of a false tooth plate from her mouth into her throat. Dr. Horr is one of the oldest practitioners in Dubuque, having been engaged in his profession here for over thirty years, and for twenty years had been the family physician in the household of Mr. Bradley.

SAGINAW, Mich., Feb. 15.—Mrs. Patrick Callaghan, of Thomastown, died here this afternoon while under the influence of chloroform administered by Dr. Davis, who was about to perform an operation on one of her thumbs.

These cases—taken from the daily papers—show the dangers of administering chloroform. The first, especially, is suggestive. Anæsthetics should never be given without first removing all artificial plates from the mouth. The physician or dentist who neglects this is censurable in the highest degree.



Apropos to the foregoing is the following—also from the daily press—which may be taken for what it is worth, and no more.

#### THE DANGER FROM CHLOROFORM.

A commission of experts of the highest standing employed by the nizam of Hyderabad to investigate the use of chloroform as an anæsthetic has just made a report, in which he declares that the danger from chloroform is not to the heart, as is generally supposed, but to the lungs. It says: "However concentrated the chloroform may be it never causes sudden death from the stoppage of the heart. \* \* \* Chloroform has no power of increasing the tendency to either shock or syncope during operations. \* \* \* The truth about the fatty heart seems to be that chloroform per se in no way endangers such a heart, but, on the contrary, by lowering the blood pressure lessens the work that the heart has to perform, which is a positive advantage." The practical conclusions of the commission are that the safe administration of chloroform depends on careful attention to the respiration. Care must be taken that it is not interfered with, and if by any accident it stops, artificial respiration must be instantly begun. Rules on this subject are given, by constant attention to which the commission asserts that chloroform can be given with perfect ease and absolute safety.

#### AMERICAN DEGREES IN GERMANY—WHY THE GERMANS HOLD THEM WORTHLESS—SUCCESSFUL AMERICANS.

Notwithstanding the refusal of the medical authorities to recognize American degrees, which proceeding has deeply mortified the students from this country, several Americans have achieved renown in the Capital of the German Empire, especially in dentistry, in which they stood unrivalled, and in bacteriology, in which Dr. Miller, the chief professor in the dental institute of the Royal University, holds the highest place in the whole Empire. He graduated at the University of Pennsylvania and is also an M. D. of the University of Berlin. His treatise on "Mouth Germs" is an acknowledged text-book here. Dr. Goettinger, also a graduate of the Pennsylvania Dental Institute, has the best-paying practice in Berlin, including Princes, court officials, and the Empress Victoria herself among his patrons. The Empress was affected with a raging toothache and applied to Prof. Busch of the Royal Institute of Dentistry, Berlin, to have it drawn. The professor, fearing that if he should in any way bungle the job he might lose his position, respectfully declined to meddle with the imperial molar, and the Empress resorted to Dr. Goettinger, who undertook the operation and carried it out successfully. The Empress was delighted and smiled her warmest thanks, while the Emperor, besides paying a liberal fee, offered Dr. Goettinger the highest medical title in Germany, that of "practischer Zahnarzt" to the court, but Dr. Goettinger modestly declined the honor. Dr. Dolley, Professor of Hygiene in the University of Pennsylvania, who is staying here, is always addressed as plain "Mister" by the faculty, yet he is in private recognized as a man of eminence in medical science.

Privy Councilor Klueffel, on being applied to, said: "The American colleges differ too much in quality. You will see in the lists an excellent institution side by side with a money-making humbug, and the pressure of our affairs is such that we cannot take the time to distinguish the true from the false."

Dr. Schmidt, the Curator of the Berlin University, said: "No, I cannot explain why Swiss, Australians, English and Russians are permitted to register as M. D.'s but not Americans, but I am inclined to attribute it to the laxity of the American law regarding the conferring of degrees."

The American students who have been refused and dismissed from the Berlin University are: Clarence Kellogg, William Porter, W. A. Duranger, William Kelley, Richard Schulenberg and David Jamieson.—*Exchange*.

# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, APRIL 15, 1890.

No. 4.

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## ORIGINAL COMMUNICATIONS.

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A CRITICAL EXAMINATION OF THE TEETH OF SEVERAL RACES, INCLUDING ONE HUNDRED AND FIFTY MOUNDBUILDERS, SELECTED FROM THE COLLECTION OF THE ARMY MEDICAL MUSEUM AT WASHINGTON, D. C.

By E. G. BETTY, D. D. S., CINCINNATI, OHIO.

In offering the results of these investigations to the professional world, I feel that I am treading upon an unknown ground—one that has not been explored in the manner these tables indicate—each case so thoroughly in detail. My ultimate purpose is the drawing of deductions from the mass of evidence collected, viz., when the number of specimens reaches into the thousands, then we may hope to have sufficient evidence upon which to base reliable and scientific conclusions.

Data of the kind here presented, may be collected by any one choosing to devote the necessary time, and who is near or has access to a collection of pre-historic and modern crania, be it large or small. The collection from which these were studied is that of the Army Medical Museum at Washington, D. C., in number about four thousand, though at the present time it may greatly exceed that figure, as constant additions are being made by the United States Army and Navy Surgeons.

I owe to Surgeon J. S. Billings, Curator of the Museum, the privilege of making these studies, and I here desire to express my thanks for his kindness and courtesy to me during my six weeks labor in the craniological department of the Museum.

When entering upon the work, I had no conception of its meaning and extent, no definite idea as to where and what it would lead. And as the investigations progressed the subject opened up amaz-

ingly, branched out in every direction, comprehended so much, demanded such a broad knowledge of mankind, his many forms, colors, climate, food, habits, and what-not that I became discouraged and hardly dared pursue the work, knowing that the few cases I had time to tabulate would be but a drop in the bucket.

Upon reflection I determined to go ahead, promising myself that as time and opportunity permitted I would continue in the same plodding manner, and, in the course of time, not only add more to the total, but, perhaps, my efforts might be the means of inducing others to pursue the same line of research, or make improvements suggested by my own.

The general plan upon which the examination was conducted includes: race, age, sex, lateral and antero-posterior measurements of the dental arch (i. e. the alveolar ridge) above and below, irregularity, abscess, caries, calculus, facial angle, and lastly a column for general remarks.

This plan covers a great deal of ground, though a different system of measuring the diameters of the arch may be devised, which will give a more graphic idea of its shape and size. Then, too, some other way of designating the extent and location of caries, (something after the fashion of Dr. Ottofy's table) abscess and irregularity. The measurements above alluded to, relate to the lateral, *i. e.*, the width of the arch, and the antero-posterior diameter being the distance from the heel to the gingival border at the median line.

The lateral measurement is a distance taken from a point opposite or at the middle of the third molars, from the outer edge of the socket, whether the teeth were present or not. This "out to out" does not mean from out to out or external to the widest part of the heel of the arch, but from the outer boundary of the socket, *per se.*, that point where the tooth was or is in contact with the inner wall or aspect of the socket. This base is, in consequence, a more fixed point and from which more reliable measurements could be made.

The fluctuation or variation in the projection of the teeth from the alveolar ridge, precludes the possibility of attaining anything like stability or uniformity in the measuring points. In those crania where the teeth were absent in the specimen but present at death, the lateral measurements are just as reliable and exact as those in which they are present, having been made from that part of the outer wall of the alveolus in direct contact with the



tooth when in position. In those cases where the third molars were either lost before death or had not been erupted, the measurements were taken from an imaginary point determined by the size of the teeth remaining and the line of the alveolar ridge on the body of the maxilla. In senile mouths, the measurements are necessarily approximate, the basic points being determined by the judgment only.

The antero-posterior measurement is taken on the median line from the "alveolar point," *i. e.*, that point at the gingival margin of the alveolus in the depression between the central incisors. This point is constant, all things being equal, and is used by craniologists for that reason. From the alveolar point, the line follows the median line backward to a point directly posterior, and bi-secting a line drawn immediately posterior to the third molars.

The rule for these measurements applies to both upper and lower jaws.

It may be well to note some exceptions.

In the upper jaw, for instance, the alveolar point is more constant than the anterior margin of the central incisors, which may be pushed unduly forward by thumb-sucking, or a natural prognathism. The reverse may also be the case in an over-hung jaw. In either event, the normal occlusion of the upper and lower jaws will be greatly interfered with. Then again, exostosis, hypertrophy, abnormal or accidental projection of the teeth out of the usual plane, would give figures that would not be a true index of the alveolar arch or ridge.

Another instance is afforded by the partial eruption of the third molar or molars, as the case may be. When advancing from the coronal process, the crown of the tooth forces away the compact layer of bony tissue overlying it, and at this particular time the tooth occupies a greater portion of territory that it does when eruption is complete and the walls of the alveolus have closed up around the neck. This of course has a greater or lesser modifying influence upon the width of the arch at the heels.

In some cases the variations I mention are very marked, and would falsify the true figures indicating the development of the jaws.

No measurements have been made of the depth of the palatine arch for the reason that I could neither discover nor invent any system or method that would reduce it to a reliable numerical value. There are several reasons for this. In some cases the teeth

are all present and in various stages of abrasion, so that no measurement could be made either from their occluding surfaces or the alveolar ridge; other specimens had no teeth present; others were edentulous, manifestly, the task (to me at least) was impossible.

Neither did I make any measurements of the length, breadth, thickness, characteristics, etc., of the jaws themselves, as that feature comes within the province of the craniologist. I therefore studiously avoided noting anything that would interfere, conflict with or forestall the work of the craniologist at the Museum, the result of whose labors will be published by the Government at some future time.

The age of skulls in the post mortem or dissicated state is in all cases subject to doubt. By this I mean the age of the individual at death.

The age of the skulls given in the catalogue of specimens in the anatomical section of the United States Army Medical Museum is no exception, probably for one reason: that they were collected from such diverse sources and the data accompanying them is not specific, and therefore scientifically unreliable.

There is a way however of approximating the age. The following translation from the French of M. Paul Topinard, by Mr. P. Tracy, of the Museum, will be found interesting and instructive.

"The age is diagnosed by the teeth, and accessorially by several sutures, up to the adult age; next by the wear of the teeth, by the more or less old atrophy of the alveolus following their loss, after from about thirty to thirty-five years. Finally, in an advanced senile period, by the atrophy of the cranial vault, especially by two effacements or depressions with thinning away, which are seen symmetrically prolonged from before backward on each parietal. The sex is not distinguished by any precise, infallible character, but by an *ensemble* of characters which may be resumed thus: the forms of the adult feminine skull are intermediate between those of the infant and those of the adult man; they are softened, more graceful, more firm; the processes and crests for the insertion of muscles are in them less strong.

"The following points should, preferably, attract the attention: the forehead, which is, other things equal, straighter, to such an extent that one has been able to take the opposite sexes in a group of skulls for two different types; the superciliary arches and the glabella infinitely less developed—often not at all—the vault more

horizontal, higher, the weight of the skull and the cranial capacity less; the mastoid processes, the external occipital protuberance, the styloid processes and the occipital condyles of a less volume, the zygomatic and alveolar arches more regular, the orbits higher, etc.

"But for sex as for age, there are exceptions which defy all diagnosis, or even which completely deceive. I have seen skulls absolutely senile by the characteristic atrophy of the vault and the atrophy of the maxillaries, of which all the sutures of the vault were as open as at twenty years, and reciprocally, sagittal synostoses, and pterious in the course of junction at twenty-five years, teeth absent and atrophy of the maxillary very advanced at the same age.

"Broca, in his registers, renounced the indication of the probable age of the skull, and wrote only the age of such or such a character. In the spontaneous and natural obliteration of sutures of the last kind, or physiological synostosis, the greatest individual diversities are observed. Relying upon the thesis of M. Pommerol, and upon the observations made by M. Hamy, Broca and myself in the laboratory, the following rules have been adopted by us to recognize the age of skulls :

"At forty years the region of the sagittal suture called Obelion—at about the reunion of the posterior third with the anterior two-thirds of the suture, there where the suture, from being complicated on either side becomes for a moment simple and rectilinear, where often in the new-born there exists a little supplementary fontanelle, where from this time on, there are found at the sides one or two—sometimes three—vascular foramina called parietal, joins itself deeply from the side of the internal face first, to the external face next. Sooner, later, or at the same time, but in such a way that one cannot accord as much confidence to it, another synostosis operates upon one of the sutures of the pterion, preferably the fronto-parietal, below the temporal crest.

"Setting out from the obelion by degrees, the former (synostosis) extends along the sagittal suture, next the lambdoid suture, preferably, at first, at each side of its middle part. It is, in general, at forty-five years that this takes place. From there on, the obliteration is accentuated in this vicinity, and the degree of effacement of the sutures is to be taken into consideration.

"At fifty years the coronal at the vicinity of the bregma takes its turn, the ossification extends upon the side, most often the right at



first, to judge from the first series of 126 known subjects verified by Broca.

"At seventy years the suture of the temporal scale is invaded in its turn; at eighty years it will be obliterated in its entirety. At this time there is no longer a suture open.

"But since that epoch, we have seen such considerable variations, it has so often happened that we have been mistaken on subjects of known age, that we do not dare confide in that rule."

I have given this lengthy quotation from Topinard in order that the reader may have some idea of the difficulty I experienced in determining the age of specimens not catalogued. I relied almost solely upon the general appearance of the dental arch, and more particularly upon the appearance of the teeth themselves, the state or rather the extent of abrasion, abscess due to exposure of the pulp by mechanical attrition, etc. I am very much inclined to the opinion that the practiced eye of the dentist goes a great way in estimating the age of a subject, though it is true on the other hand, that we do not deal in daily practice with the teeth and jaws in the dissipated state.

The determination of the facial angle, which I included in my tables, really has but little value, scientifically, none, as an index to the mental capacity of the subject. In the first place, craniologists do not agree as to its meaning and the manner in which it should be computed. In the second place, it conveys no idea of prognathism, in which connection there is a popular idea that the degree of prognathism is a direct index of the intellectual capacity of a people or race. I was told that there is no satisfactory method of ascertaining the degree of prognathism and of course no definite data can be had whereby it and the facial angle, either taken together or compared with, give any value in figures to indicate the mental status of the subject; but I am going beyond my purpose.

For reasons stated, prognathism has been left out of these investigations. In the Australian as a race, the prognathism is very great, and is a characteristic of that race; equally true of the negro.

I may as well say before dismissing this portion of the subject, that the gnathic index of Flower gives the entire maxillary prognathism *i. e.*, "The basi-nasal and basi-alveolar diameters," are to be taken from the basion, in the one case to the nasion, in the other to the alveolar point; and the gnathic index calculated from

$$\frac{\text{"The basi-alveolar length} \times 100.}{\text{Basi-nasal length.}} "$$

This method I am informed, is a good one and exact as far as it goes, but the objection to it is, so far as the dentist is concerned, that it does not express the prognathism as we see it in the skull and therefore useless to compute it in such a large number of skulls.

Some of the subjects as catalogued officially, include among other things, figures representing the facial angle. A number of others were not catalogued (recent accessions likely) and I had for the sake of uniformity, to determine the angle myself. This I did with an instrument devised for the purpose, and belonging to the Museum. With this instrument I verified a great many already computed, and concluded that the entire list I have tabulated are therefore uniform in that respect, viz.: the value of the angle in figures, such as it is. This angle is that of Jacquart, and is formed by the junction of two imaginary lines at the base of the anterior nasal spine of the superior maxillary bones. The first of these in the sagittal plane perpendicular to a line connecting the centers of the external auditory meati. The other is in the sagittal plane and is tangent to a point on the frontal bone, which is situated on a line drawn across the highest points of the superciliary ridges.\*

The column in the tables devoted to "remarks," enabled me to record miscellaneous observations that I could not conveniently otherwise make note of. They should be carefully read and compared with each other, as they contain valuable data. There is but little more that I can say in explanation of the tables unless it be that the groups marked "Series A," consists of 100 skulls selected by the officers of the Museum for the purpose of making a complete list of all recognized craniological measurements, to be used in the future as standard of comparison in further investigations of a like nature.

The selection was made from those best adapted\* to the purpose and as affording the nearest apparent unity with the several types represented in the museum collection.

I naturally thought this 100 typical skulls would make a good beginning for the examination of the teeth and besides afford a

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\* See "Anthropolgy," by Paul Topinard, translated by R. T. H. Bartley. London, 1878; Chapman & Hall; pp. 41, 43 and 330.

comparison, limited though the number is, with the mental development of several races. Another thing I neglected to note, is the classification of the crania into brachy-cephalic and dolicocephalic, short-headed and long-headed respectively. That, however, can be done by the reader by reference to almost any of the treatises on ethnology, anthropology, etc.

A curious fact, of which I was unaware, is the great difference in this respect between the Peruvians living upon the coast and those in the upper plateaux, it being so great as to lead one, at first sight, to imagine them as belonging to different races. There was a large number of Peruvian skulls expected to arrive during my visit at the museum (Aug. and Sept., 1888), but they did not reach there until after my time was up. This was a serious disappointment, as I greatly wished to include a number in the tables.

The group of six Apache Indians in Series A, are brachy-cephalic, *i. e.*, having a cranial index equal to or more than 80 per cent, or, the width of the skull is 80 per cent of the length.

The Austrian group gives every indication of having been buried for a long time, having been taken from very old burying grounds.

In all the series, a, b and c, I found it an exceedingly difficult matter to determine the amount and character of salivary deposits, for the reason that the majority of the skulls have been buried for a great length of time, and in consequence the deposits became detached. Again, many of the teeth have the appearance of having been cleaned, or at all events, the process of maceration and bleaching the skull, tending, no doubt, to completely remove deposits that were not originally extensive. Hence, many instances had to be designated as "traces."

In those marked "none" the majority gave no evidence of having been cleaned other than their sepulcher, and is, therefore, tolerably reliable. In all edentulous mouths, caries, irregularities, abscess and calculus is usually marked X X X. The "remarks" at any rate will explain these matters more fully in each individual case.

Series B I selected for the express purpose of making a critical examination of the best dentures the Museum afforded, and, there-

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\* This may be qualified to mean the condition of the crania; for instance, a skull *known* to be typical, might be more or less broken and totally unfitted for measurements of internal capacity, or the points from which lines and measurements are made may be lost, thus rendering it totally unfit for the purpose.



fore, chose the best specimens of the kind irrespective of race. Some are good, some bad, some indifferent. In this occurs a number of subjects which are not catalogued in the check list of 1880, having been added to the museum collection since that time, and in consequence the age, sex and facial angle had to be determined by a special investigation of each individual specimen. In all such cases the age and sex are marked ?, the figures being my own, and, of course, without verification. The facial angle I estimated by Jacquart's method, as described in another place.

I wish to make a special note of specimen number 1547, which figures, by the way, accompanying each individual indicate the museum number; I give them, in order that the subject and the examination may be identified.

This particular case, in addition to having a fourth molar on the upper left side, also has two supernumerary lateral incisors on the upper left side. The first one, judging by the root which remains, was a large one and situated immediately behind the septum, between the left central and normal lateral. The second one is in the line of the arch, between the normal lateral and the cuspid, having a separate socket in position and where the space would ordinarily be occupied by the left cuspid.

Series C, the third and last tabulated, comprises mound builders only, and numbers one hundred and fifty (150), and includes all there were in the Museum at the time sufficiently perfect to be handled and measured. There are many more, but so fragmentary and fragile that I did not attempt to disturb them.

In this series will be found

Dakota,	Mound-builders,	-	-	-	-	15
Wisconsin,	"	"	-	-	-	1
Iowa,	"	"	-	-	-	2
Illinois,	"	"	-	-	-	15
Indiana,	"	"	-	-	-	4
Ohio,	"	"	-	-	-	7
California,	"	"	-	-	-	14
Kentucky,	"	"	-	-	-	21
Utah,	"	"	-	-	-	1
Missouri,	"	"	-	-	-	1
Tennessee,	"	"	-	-	-	33
Mississippi,	"	"	-	-	-	18
Louisiana,	"	"	-	-	-	2
Florida,	"	"	-	-	-	9
Arkansas,	"	"	-	-	-	7
Total,						150

It will be observed that Dakota, Illinois, California, Kentucky, Tennessee and Mississippi furnish the largest number of specimens in the series, and the attention of the reader is called more particularly to them. It is not necessary for me to say how many of this or that group have caries, abscess, etc., as the tables are so arranged that all these matters explain and systematize themselves.

I may say with Barrett,\* that "In the jaws of all the people whose skulls I examined, I found traces of all the diseases known to modern dentistry. There were caries of the most formidable character, black, white and brown.† There were marks of abscesses which devastated great regions of tissue. There was necrosis which had caused the loss of great sloughs of bone, though I must admit that necrosis was more rare than most other oral diseases. There were great masses of tartar enveloping all the teeth in the jaw. There were indications of inflammation of soft tissues. There were exostoses and hypertrophies; absorptions and malformations; denudations and abrasions; exfoliations and irregularities."

What J. R. Mummery‡ has done for the ancient Briton, Anglo-Saxon, Egyptian and the modern races of the Orient, it becomes us to do for the copper-colored races of the Occident. To the American dentist belongs the solution of the problem, is the Indian of to-day a descendant of the so-called "mound-builders?" Was he imported via Behring's Strait from the Old World; or is he, like the Indian of the numerous mounds, the pigmy progeny of the mound-builders of Schoolcraft?

The critical examination of the teeth when taken in conjunction with many other circumstances more or less well established, will go far toward giving a plausible if not satisfactory answer to the question. We must study the existing Indian tribes, so far as we may, his predecessors and those of the mounds in connection with

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\* *Independent Practitioner*, Vol. IV., pp. 516, 517. A paper, by the way, one ought to read.

† These distinctions, however, I did not attempt to note in the great majority of cases, as it is practically impossible in the dry state of the subjects.

‡ On the relations which dental caries, as discovered among the ancient inhabitants of Britain, and among existing aboriginal races, may be supposed to hold to their food and social conditions. "Translations Odontological Society of Great Britain," second series, Vol. I, page 7.

climate, food, social condition,\* etc., etc., just as we would study the surroundings of the white races of to-day, did we assume to understand the circumstances that produce their effects upon the living organism.

It is a question undecided, whether what we understand as the mound-builder *is* the mound-builder or not. Schoolcraft and others are authority for the statement that there are but very few instances of the exhumation of what they term the genuine mound-builder ; certainly not more than ten or fifteen. These prove to have been of a race entirely different from anything we know of the kind. One of the last finds was made by the late Dr. Walter A. Dun, of Cincinnati, near Chillicothe, Ross Co., Ohio ; and the results of his explorations were read before the Natural History Society of Cincinnati, in January, 1884. He gave me the task of making the examination of the teeth and jaws†, and remarked that it was the first of the kind that had ever been made.

All these speculations however, I shall have to leave to the reader, with the injunction to study them carefully.

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\*Geographical distribution of dental caries in the United States. E. G. Betty, *Ohio State Journal*, Vol. I, p. 249. Ibid. Vol. V, p. 570.

† *Dental Register*, Vol. XXXVIII, p. 82.



## SERIES I.

RACE.	AGE.	SEX.	UPPER JAW. LATER- AL.	UPPER JAW. ANTI- POST.	LOWER JAW. LATER- AL.	LOWER JAW. ANTI- POST.	IRREG.	ABSCISS.	CARIES.	CAL.	P.A.	REMARKS.
Ponka Indian. 797.	60	f	2 1/2, 1 1/8, 1-64	1 1/2, 1 1/8, 1-32	2 1/2, 1 1/8, 1-32	1 1/2, 1 1/8	None.	None traceable.	S. 1. 1 m.	Buc. sur. sup. left bis. and m's	74	A large number of the teeth lost in preparation of specimen. Great mechanical abrasion, pulp chambers reached and passed. One s. m. and one i. m. lost by disease or extraction, reformation of bone complete in socket
Ponka Indian ex- humed at old Pon- ka Agency, D.T. 487.	45	m	2 1/2, 1 1/8, 1-16	2 1-32	2 1/2, 1 1/8	2	None.	None traceable.	Traces on buc. sur. lower 2 m's.	None.	74	Large, square, heavy teeth, abrasion normal at this age. 32 teeth present.
Ponka Indian. 485.	70	f	2 1/2, 1 1/8, 1-64	1 1/2, 1 1/8, 3-64	2 1/2, 1 1/8, 1-32	1 1/2, 1 1/8, 1-32	None.	None traceable.	None.	None.	76	Great abrasion to gum line, upper teeth all present at death. In lower jaw all molars gone and great absorption of ridge. A. p. measurement made from a line drawn back of where post. sur. of 3 m's probably was.
Ponka Indian. 486.	55	m	2 1/2, 1-64	2 1-32	2 1/2, 1-32	1 1/2, 1 1/8, 3-32	None.	None.	Prox. cavi- ties in s. i. 1 and 2 m's.	Traces on buc. sur. s. m's and lingual sur. lower m's and inc.	72	Large, square, dense teeth, abraded about one-third the length of the teeth anterior to the 2 m's above and below.
Navajo Indian. 177.	60	f	2 1/2, 3-64	1 1/2, 1 1/8, 1-64	2 1/2, 1 1/8, 3-32	2	x	x	x	x	78	All teeth broken and lost in preparation as sockets plainly indicate. The sup. 3 m's appear to have been lost early, filled with cancellous tissue. Measurements made from out to out of alveoli.
Navajo Indian. 97.	30	m	2 1/2, 1-32	2	2 1/4, 1 1/8, 3-32	1 3/4, 3-16	None.	L. 1. 1 m. alveolus ne- crossed.	None.	Buc. sur. sup. m's.	79	Teeth fine, white and dense, medi-um size, 32 present, partial abrasion, just through the enamel anterior to 2 m's.
Navajo Indian. 787.	80	f	2 1/4, 1-16	1 1/2, 1 1/8, 1-32	2 1/2, 1 1/8	1 1/2, 1 1/8	No evi- dence.	L. r. 2 bl. slight ne- crosis.	A. p. 1. r. 1 m.	No trace.	77	In upper jaw alveolar ridge all ab- sorbed back of 2 bl. on right side. No teeth remaining in upper jaw, sockets remaining for the rest except central incisors. In lower jaw, all present ex- cept 1. 2 and 3 m's. Extensive abrasion.
Navajo Indian. 633.	30	m	2 3/8, 1-16	2 1/8	2 1/2, 1-32, 1-64	2 1-32	None.	None.	S. r. 3 m. pp.	None.	76	Most complete and perfect specimen in the group. Abrasion slight, teeth normal in size and density. Articula- tion perfect.

Stoux Indian. 247.	55	f	2 $\frac{3}{8}$ , 1-16	1 $\frac{3}{4}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$ , 1 $\frac{1}{8}$ , 1-16	None.	None.	None.	Mere traces	79	Extensive abrasion. Teeth fine; small. Sup. r. 3 m. not erupted.
Stoux Chief from Fort Pierre, Upper Missouri. 380.	60	m	2 $\frac{1}{2}$ , 1 $\frac{1}{8}$ , 1-16	2 $\frac{1}{8}$ , 1-64	2 $\frac{1}{2}$ , 1 $\frac{1}{8}$ , 1-32	2	None.	None.	None.	Slight traces.	71	About half the teeth lost in preparation. Extensive abrasion. Large, square, well-formed teeth.
Stoux Chief, "Weak Eyes," 483.	45	m	2 $\frac{1}{2}$ , 1 $\frac{1}{8}$ , 1-32	2 1-16	3	2 1-32	None.	S. r. 1 m. absorption or necrosis.	None.	Very slight traces.	75	Very large, dense, square teeth, nearly all in the upper jaw lost in preparation; extensive abrasion.
Pah Ute Indian. 1794	35	f	2 $\frac{5}{8}$	2 5-16	2 $\frac{1}{2}$ 7-64	2 7-64	None.	None.	None.	Traces on lingual surface lower incisors.	70	Pin-shaped supernumerary incisor between the superior incisors. Most perfect set of teeth in this series, and one of the most perfect in the museum. Teeth white, solid; slight abrasion only.
Pah Ute Indian. 1953	25	m	2 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{5}{8}$ 1-16	2 1-32	None.	None.	Lr. 1 m crown.	Traces.	70	Very large, square teeth; arch perfect, abrasion slight.
Pah Ute Indian. 964	40	f	2 $\frac{3}{8}$ 1-64	1 $\frac{3}{4}$ 3-32	2 $\frac{5}{8}$	1 $\frac{3}{4}$ 9-16	None.	None traceable.	None.	None.	82	All teeth in upper jaw gone in preparation except s. r. 1 m., which was lost by disease or extraction. In lower jaw four molars only remain. Great abrasion.
Pah Ute Indian. 970	40	f	2 $\frac{1}{2}$ 1-32	1 $\frac{3}{4}$ 1 $\frac{1}{8}$	Miss ing.		None.	None.	None.	Buc. sur-face, left side.	74	Lower jaw missing. Teeth very good. Abrasion normal at this age.
Pah Ute Indian. 1128	40	m	2 $\frac{5}{8}$	2 3-16	2 $\frac{5}{8}$ 1-32	2 $\frac{1}{8}$	None.	None.	Three or four crown pits in 1 m's self-limited	Traces.	73	Square arch. Molars abraded considerably. Superior incisors worn past enamel on cutting edges.
Pah Ute Indian. 966	45	m	2 $\frac{3}{8}$ 1-32	2 1-64	2 $\frac{1}{2}$ 1-16 1 $\frac{3}{4}$ 3-16		Inf. Inc's more or less twisted upon themselves.	None.	None.	None.	76	Some teeth lost in preparation. Abrasion extensive on the molars.
Pawnee Indian. 778	60	f	2 $\frac{3}{8}$ 1-32	2	Miss ing.		None.	None traceable.	None.	None.	74	Lower jaw missing. S. r. 1 m. lost by disease. Three molars on the right side, left second molar and sr. cuspid only, remaining; the other sockets filled with alien teeth.
Pawnee Indian. 529	25	m	2 $\frac{1}{2}$ 1-16	2 1-16	2 $\frac{5}{8}$	2	Upper and lower incisors crowded and lapped.	None.	A few crown pits in two or three of the molars.	Buc. sur-face, sup. m's and ling. lower incisors.	76	Very good teeth. Lower third molars well developed—two distinct roots. Sr. cuspid not fully erupted, owing to a large V-shaped space between the central incisors.

† Ethnological section.

RACE.	AGE	SEX	UPPER JAW.		LOWER JAW.		IRREG.	ABSCISS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Seminole Indian. 335	30	f	2 1/8 1-16	2 1-16 1-32	Miss lng.		None.	None.		Ring on the only tooth left.	80	V-shaped arch very well marked; only one tooth left—sr. 1st m.—though all were present at death, but lost in preparation.
Seminole Indian. 334	55	m	2 1/4	2 1/8 1-16	Miss lng.						73	No teeth remaining, though all pres- ent at death. Measurement from out to out of ridge. Very old specimen.
Yucatan Indian from a tumulus near Tixpehuac. 624	30	m	2 1/8 1-16	1 3/4	Miss lng.						76	But three or four teeth left at time of death. The molars and incisors lost before decease. Sockets filled with cancellous tissue.
Yucatan Indian from a tumulus near Tixpehuac. 627	30	f	2 1/2	2	Miss lng.		None.	None.	Two small crown - pits in 2d m's.	Traces.	70	Teeth all remaining at death. But four m's remain—1st and 3d of both sides—medium size but of splendid structure. Cusps well developed—no abrasions. Third m's not erupted, and lost in preparation.
Chippewa Indian. 380	50	f	2 3/8 1-32 17/8	1-16 1-16	2 1/2 1-16	1 7/8	None.	Lr 1 m socket necrosed.	Ap. 1. 1. 2d bi.	Rings around nearly all the teeth.	70	Teeth large and square. Very much abraded, especially the lower molars. Teeth all present at death but one. 3d m's as large as the others—espe- cially the lower.
Chippewa Indian. 188	40	m	2 1/2 3-32	2 1/8	2 3/4 1-16	2 1-32	None.	None.	None.	Traces.	76	Teeth very large and square. Lower m's worn off to enamel junction. L. 3d m's fully as large as the others. Upper third m's small. Teeth heavy, dense. All present at death.
Peruvian Indian, from Chulpa, Dept. of Puno, Peru. 1594	65	f	2 1-16	1 3/4	*	*	None.	Sr 1 m. and 2 bi. cent. incies.	None.	Trace.	70	Very extensive abrasion, crowns com- pletely worn away, below necks. Teeth apparently were strong. Lower jaw missing.
Peruvian Indian, from one of the Neucos, near Lima. 251	45	f	2 1/2	2 1-16	*	*	None.	None.	Prox. s. r. 2d and 3d m's	Traces.	68	Teeth very strong, abrasion beyond enamel line in the molars, anterior teeth lost in preparation. Lower jaw missing.
Peruvian Indian. Pachitamac tribe. 250	40	m.	2 1/2 1-32	2 1/4	*	*	None.	None.	Two crown pits in molars.	None.	74	Teeth very large and heavy, abrasion just beyond the enamel junction.



Peruvian Indian. Quitina Pachica- mac tribe. 74	60	m.	$\frac{2}{1-16}$	$\frac{17}{8}$	$\frac{13}{8}$ , 1-16	$\frac{17}{8}$	*	*	*	Traces.	74	No teeth in upper jaw. Nearly all present at death in lower jaw; lost in preparation. The few remaining show extensive abrasion.
Minnetaree Indi- an, from Knife River. 359	60	m.	$\frac{21}{4}$ , $\frac{2}{1-16}$	$\frac{2}{1-16}$	*	*	None.	None.	None.	Traces.	72	Teeth nearly all lost in preparation; very extensive abrasions on those remaining. The molars exhibit very large buccal roots with great divergence from the bifurcation.
Minnetaree Indian. 84	60	f.	$\frac{23}{8}$ , $\frac{2}{1-16}$	$\frac{2}{1-16}$	*	*	None.	sr. 1 m.	None.	None.	74	Teeth nearly all lost; those remaining show extensive abrasion. The sockets were filled with putty for the purpose of taking the internal capacity of the cranium with water.
California Indian, Santa Cruz Island, in the ground a long time. 1419	50	m.	$\frac{21}{2}$ , $\frac{14}{1-16}$ , op. $\frac{2}{2 m}$ , $\frac{21}{2}$ , $\frac{14}{1-16}$ , $\frac{18}{1-32}$	$\frac{21}{8}$	$\frac{23}{4}$ , $\frac{1}{1-16}$	$\frac{21}{8}$ , $\frac{1}{1-16}$	None.	s. l. 1 bl. outer wall necrosed.	None.	Large de- posits on the lower right molars.	72	Very large sup. arch—the alveolus $\frac{1}{2}$ 18, 1-16, the four 3d m's all having well marked roots—the up. three, lower two. Teeth very large, square, dense; extensively abraded. All teeth present at death except the 1 s. l. bl.
California Indian, Santa Cruz Island. Old specimen. 1347	45	f.	$\frac{21}{4}$ , $\frac{1}{1-32}$	2	$\frac{21}{4}$ , $\frac{18}{1-32}$	$\frac{13}{4}$ , $\frac{18}{1-16}$	None.	s. l. 2 m. necrosed socket.	None.	Mere traces.	74	Nearly all teeth present; largely abraded; molars not very large; all smaller than in 1419, but excellent structure.
California Indian, Santa Cruz Island, Old specimen. 1416	50	m.	$\frac{21}{2}$ , $\frac{3-32}{3-32}$	$\frac{2}{1-16}$	$\frac{21}{2}$ , $\frac{1}{1-16}$	$\frac{13}{4}$ , $\frac{18}{1-32}$	None.	None deter- minable.	None.	Traces.	70	Teeth larger than medium; square and dense; largely abraded. All present at time of death except s. l. 2 m. and the two 1 m's, which were probably not erupted.
California Indian, Santa Cruz Island, Old specimen. 1518	50	f.	$\frac{23}{8}$	$\frac{17}{8}$	$\frac{21}{4}$	$\frac{2}{1-16}$	None.	sup. R. 1 bl.	p. p. s. r. 2 m.	Large de- posits on s. r. bl. and cuspid.	72	Small teeth extensively abraded; sup. laterals none erupted. Teeth of good quality; s. l. 1 and 2 m's lost during life; sup. 3 m's rudimentary.
California Indian, from St. Miguel's Island. 1061	45	m.	$\frac{21}{8}$ , $\frac{1}{1-32}$	$\frac{17}{8}$ , $\frac{1}{1-32}$	$\frac{23}{8}$ , $\frac{1}{1-16}$	$\frac{17}{8}$ , $\frac{1}{1-32}$	None.	None.	None.	Buc. & ling. sur. lower molars.	77	All the upper teeth lost in preparation except four. In lower jaw, the molars only remain. Solid square and must have been abraded extensively.
California Indian, from St. Miguel's Island. 1067	40	f.	$\frac{21}{4}$ , $\frac{1}{1-16}$	$\frac{13}{4}$ , $\frac{1}{1-16}$	$\frac{25}{8}$ , $\frac{1}{1-16}$	$\frac{15}{8}$	None.	l. r. 2 m.	None.	Traces.	74	Teeth very much abraded. In lower jaw considerable absorption of ridge; teeth lost during life. In upper jaw teeth all present at death, but lost in preparation. Lower jaw doubtful.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANT- POST.	LATER- AL.	ANT- POST.						
California Indian, from St. Miguel's Island. 1062	60	m	2 $\frac{5}{8}$ , 1-32	2	2 $\frac{1}{2}$ , 1-16	2 1-6	None.	s. l. 1 m. extensive necrosis.	None.	Gingival margins more or less on all teeth.	74	Teeth large and square, dense, ex- tensively abraded; some of the bicus- pids above worn to the pulp; some of the molars nearly so.
California Indian, from San Miguel's Island. 1068	50	f	2 $\frac{1}{4}$ , 1-16	1 $\frac{3}{8}$ , 1-32	2 $\frac{5}{8}$ , 3-32	2	None.	s. l. 1 and 2 m's, exten- sive necro- sis.	None.	Traces.	72	All teeth in both jaws present at death, except as mentioned in "ab- scess"; three only remain, they in the upper jaw; very extensive abrasion, judging from them. The first molar lower right side had three distinct roots, two anterior and one posterior.
California Indian, from San Miguel's Island. 1066	60	m	2 $\frac{1}{2}$ , 1-32	2	2 $\frac{1}{4}$ , 1 $\frac{1}{8}$ , 3-32	2	None.	None.	None.	Large de- posits on buc. & ling. surface of S. M's.	74	Teeth very large and square, heavy; extensive abrasion.
California Indian, from San Miguel's Island. 1063	30	f	2 1-16 op. 24 m's 24, 3-16	2	2 $\frac{1}{4}$ , 3-16	1 $\frac{1}{2}$ , 1 $\frac{1}{8}$ , 1-16	None.	l. 1. 1 bl.	None.	Traces.	71	Teeth small, square, heavy; exten- sive abrasion.
Apache Indian, from Camp Reno, Arizona. (Tonto.) 891	35	f	2 $\frac{1}{4}$ , 1-16	1 $\frac{3}{8}$	miss	ing.	None.	None.	Small crown pits in molars.	None.	76	Teeth small and of good structure; arch flat and not deep; all teeth pres- ent at death, but three molars re- maining on left side.
Apache Indian, from Dickerson's Ranch, Arizona. (Majave) 209	40	m	2 $\frac{1}{2}$ , 1 $\frac{1}{8}$	2	2 $\frac{3}{4}$ , 1-16	1 $\frac{7}{8}$ , 1-16	None.	None.	Two or three crown pits in molars.	None.	77	Teeth small, good structure; lower molars extensively abraded; upper teeth all abraded beyond enamel junc- tion. Arch deep.
Apache Indian, Arizona. Arivapa. 1168	25	m	2 $\frac{1}{2}$	1 $\frac{3}{4}$ , 1-16	2 $\frac{1}{2}$ , 3-16	2 1-16	sup. bicuspids depressed; saddle arch	None.	A few crown pits in molars.	buc. surf. sup. m's.	77	The 1st and 2d m's of lower jaw very large; upper first m's very large, oth- ers medium; very good structure; abrasion slight; arch (palatine) deep; sup. 3d molars very small.
Apache Indian, 329 from Texas.	60	m	2 $\frac{1}{4}$ , 1-16	2	2 $\frac{1}{2}$ , 1-16	2	None.	None.	None.	Traces.	76	Teeth small, abrasion not so marked as would be expected at this age, only two or three of the molars being slightly cupped.

30	f	2½	2	2½	1-7/8, 1-16	None.	None.	None.	Rings on some of the molars above and below.	80	Teeth of medium size; quality very good; abrasion slight; the four third molars in process of eruption; arch flat.
Apache Indian, from Ojo Caliente, 634											
35	f	2¼	134,	miss ing.		x	x	x	x	79	Teeth all present at death, excepting s. l. 1 m. A fractured root remaining shows the structure to have been very good. No teeth in specimen.
Asiatic Eskimo, from Plover Bay, 267	m	25/8	134, 1-16	21½, 3-16	134	None.	None defective.	None.	Traces.	74	Teeth small and nearly all separated; greatly abraded on lower jaw, more especially the anterior teeth. Arch broad and deep.
Asiatic Eskimo, from Plover Bay, 277	m	25/8 op. 2 m. 2½	178, 3-32	25¾, 1-16	2	None.	Both sup. cent. incisors.	None.	Slight traces.	77	Teeth medium size; lower molars very large; teeth all present at death; abrasion normal; sup. 3d m's two roots; lower the same. Arch flattened.
Chuckchee w. coast of Behring's Strait; (called also) Reindeer Tribe, 263	m	2½, 1/8, 3-32	2 1-32	miss ing.		Incisors flattened across fr'm cusps, reducing the ant. p. means	None.	None.	Deposits on all the teeth except the anterior.	69	Teeth large; 3d m's almost as large as the others. Arch very deep and broad; abrasion slight. Called also Wandering Chuckchee.
Chuckchee, Reindeer Tribe, fr'm Arlekanechecke Island w coast. Behrings st. 264	m	2½	178	miss ing.		None.	None.	None.	Traces.	70	Teeth small and abraded; more than its age would indicate; arch flat; teeth all present at death; only 3 molars remaining in specimen.
Cheyenne Indian, killed at Sand Creek massacre in 1864. 8	m	2½, 1/8, 1-16	2½	284, 1-16	2 1-16	None.	None.	None.	Traces.	74	Molars of average size; lower 3d m's as large as 1 and 2; lower molars extensively abraded; structure dense; arch broad and not unusually deep.
Cheyenne Indian, 463	f	2 1-16	134, 3-32	284	134, 1-16	x	x	x	x	75	Endentulous at death; measurement from out to out of ridges, and a. p. to imaginary line where 3d molars should be.
Chilian Indian, an Araucanian killed by Chilean troops. 970 & 971 do not belong to 100 t. s. 971 s. s.	m	2¼, 3-16	178, 3-16	25¾	134	None.	s. r. 1 m.	s. 12 bl. pp. s. l. 1 m ap. and crown. None in lower jaw.	Traces.	78	Teeth very good; small; incisors worn below enamel junction.
Chilian Indi'n, ('ss.' Surgical Section.) 97	m	2 3-16	2	*	*	s. r. cent. twist'd up'n itself.	None.	pp. s. l. 1 bl. ap. s. l. 1 m.	None.	76	Teeth very good; larger than in 971; abrasions show use of teeth not more than normal.



RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCISS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANT- POST.	LATER- AL.	ANT- POST.						
Fiji Islander. "Vendovi," chief of one of the Islands. 292	40	m	2 $\frac{1}{2}$ , 1-16 2 m's 23 $\frac{1}{2}$ , 1-16	1 $\frac{1}{2}$ , 21 $\frac{1}{2}$ 1-32	23 $\frac{1}{2}$ , 1-32	21 $\frac{1}{2}$ , 3-32	None.	None.	None.	Traces.	70	Very large deep arch, measuring 1 $\frac{1}{4}$ in. from the palate to the grinding surface of 1st s. m.; teeth very large and well formed, the lower 3 m's as large as the rest, and as well developed—the upper ones nearly so.
Fiji Islander.	293	f	21 $\frac{1}{2}$	2 3-32	21 $\frac{1}{2}$ , 3-32	21 $\frac{1}{2}$ , 1-32	None.	None.	A few small pits.	Traces.	75	Teeth all present at death; medium sized cusps, well developed; arches regular and articulation normal.
Alaskan, from Prince Williams Sound.	35	f	23 $\frac{1}{2}$ , 1-32 op. 2 m. 21 $\frac{1}{2}$ , 1-16	2	*	*	None.	None.	None.	Traces.	71	Arch round, contracted at the heels; teeth very perfect, molars large and square; abraded just past the enamel junction.
Alaskan, from Prince Williams Sound.	70	m	21 $\frac{1}{4}$	13 $\frac{1}{4}$	3	2 1-32	None.	At all teeth back of cusps in up. jaw; in low. jaw the ant. teeth.	None.	buc. and lab. surfaces lower molars.	76	In upper jaw all teeth lost by abscess, etc., except right cuspid; very great absorption of ridge; palatine arch flat; in lower jaw four remaining teeth show good structure but very great abrasion.
Alaskan, from Prince Williams Sound.	55	m	21 $\frac{1}{2}$	21 $\frac{1}{8}$	* The jaw att'ch'd does n't belong to the spec'n.	*	None.	None.	None.	Traces on buccal surfaces.	73	Round arch, deep; teeth most excellent; molars small, solid and white; all teeth worn flat, though the abrasion is normal at this age.
White.	1756	f	21 $\frac{1}{4}$ , 1-16	13 $\frac{1}{4}$ , 1-16	25 $\frac{1}{8}$ , 1-16	13 $\frac{1}{4}$ .	Upper m's & bicuspids somewhat twisted.	1. r. 1 m.	6 cavities 4 in bicuspids and 2 in 1. 1. cusps.	Rings on molars and traces on other teeth.	77	Teeth small; cupping of the molars; several molars and bicuspids lost during life; fair quality.
White.	56	f	21 $\frac{1}{4}$ , 1-16	2 1-16	miss	ing.	None.	Extensive necrosis of socket s. r. 1 m.	pp. s. r. 2 bl crown pits in s. r. 2 m.	Lingual rings on nearly all the teeth.	75	Teeth of good structure, white, very little abrasion; molars much wider at necks than grinding surface; 2 and 3 m. lost in life s. 1. side; the s. r. 3 m. has 3 distinct roots.
White.	1989	f	21 $\frac{1}{4}$ , 1-16	2	21 $\frac{1}{2}$ , 1-16	13 $\frac{1}{4}$ , 1-32	None.	None.	Two or three crown pits in molars.	Large deposits on nearly all the teeth.	67	Teeth small and white; little or no abrasion; s. r. e. 1. lost in life, and 2 m's on 1. 1. side lost in life, 1. r. 1 m. also.
White.	62	m	2 1-16	2 3-32	21 $\frac{1}{2}$ , 1 $\frac{1}{2}$ , 1-32	13 $\frac{1}{4}$ , 1-16	x	x	x	x	78	Not a single tooth remaining; some lost before, some after death; sockets badly broken up.

Austrian.	1932.	31	f	2 1/4	1 3/4, 3-16	*	*	None.	M's and bils. on left side gone, presumably by abscess.	Very extensive in all the teeth remaining except cuspids, decayed to pulp chambers.	—	78°	Very bad denture. Indeed, the extensive caries indicating poor structure coupled with great neglect, the Austrian being in a civilized country.
Austrian.	1933.	50	m	2 5/8, 1-32	2	2 1/2, 1-16 1 7/8, 3-32		Lower incisors slightly crowded.	Both sup. 2 m's gone possibly by abscess.	Ap. cavities in both sup. m's; crown pits in two or three lower molars.	Traces on lower incisors.	76°	Splendid, solid teeth. Extensive abrasion above and below on the molars.
Austrian.	1933.	65	m	2 1/2, 1-32 1 7/8, 1-16		2 5/8, 1-16 1 3/4, 1-32		None.	S. I. 1. m. several in lower jaw probably lost by abscess.	Caries in crown of one lower molar only.	Traces below; heavy and extensive black stains resembling calculus.	75°	Upper teeth nearly all gone in preparation; only one lost by disease. Heels of the maxillary process exposed. In lower jaw, several teeth lost by disease.
Austrian.	1935.	45	f	2 3/8, 1-32 1 7/8, 1-32		*	*	None.	S. I. 2d and 3d m's necrosed process.	Ap. In 3d m. right side.	Traces.	72°	Most of the teeth lost in preparation. Palatine arch deep.
Austrian.	1938.	45	m	2 1/4	1 7/8, 1-16	*	*	None.	—	—	—	68°	Only one molar remains. The appearance of the sockets indicates that the teeth were all present at death. No evidence of abscess. The remaining molar is abraded to enamel junction.
Austrian from St. Gilgen, Austria.	1933.	65	f	2 1/4	2 1/8	*		None.	The heels are broken away, impossible to state whether abscess or not.	—	—	75°	But two teeth and one root remain, balance lost during life. Palatine arch flat, ridge fairly marked.
Bavarian from South Bavaria.	1975.	65	m	2 3/8, 1-32	2 1/8		Mis sing.	x	x	x	x	77°	About 8 or 10 teeth present at death, none in specimen. The molars on the s. I. side lost in life.

RACE.	Age.	Sex.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Bavarian from South Bavaria. 1976.	70	f	158	188, 1-16	Mis sing.		x	x	x	x	81°	Teeth all gone in life. Great absorption of ridge. Almost obliterated. Very old specimen.
American Negro. 951.	60	f	21½, 1-32	2 1-16	21½, 1-32	21½, 3-32	None.	—	Traces.	Traces.	85°	Teeth medium sized. Extensively abraded. Caries self-limited. U. R. jaw teeth all gone by disease, save 1. r. from 1 bl. to 3 m. Teeth dense.
American Negro. 412.	75	m	238 op. 2 m's 21½, 3-32	2 1-32	21½, 18, 1-16	21½	—	—	—	—	81°	Edentulous; great elongation of inf. max.; measurements on imaginary points only.
American Negro. 411.	30	m	21½, 14 1-16	21½, 1-32	234	2 3-32	Sup. inc. somewhat twisted and lapped.	None.	Crown pits in molars and traces on ap. sup. bicusplids.	Traces.	71°	Sup. arch V shaped, teeth very good, no abrasion. Cusps well marked; both lower 1 m's lost by disease.
American Negro. From dissecting room Columbia Med. College. 45.	35	m	258	2 3-16	234	21½	None.	None.	None.	Mere traces	71°	V shaped arch; slightly flattened anteriorly, that is, the sup. arch; magnificent, large, white teeth, slightly abraded.
American Negro. Richmond, Va. 950.	70	f	238	218	21½, 1-16	2	None.	Impossible to determine.	S. 1, 2 m. p. other traces.	Traces.	74°	Lower jaw almost edentulous, the few remaining at death lost in prep.; 5 teeth remaining above show considerable cupping.
American Negro. Richmond, Va. 983.	25	f	21½	2 1-16	21½	178	None.	None.	S. r. 2 m. buc. crown pits in some of the molars.	Traces.	77°	Large teeth, bluish white, cusps well developed, no abrasion, two or three of the teeth present, do not belong to the specimen.
Sandwich Islander. 433.	65	m	2 3-16	178	278	2	Cannot determine.	None in lower jaw; cannot determine the upper.	None.	None.	77°	In the lower jaw all the teeth were lost in preparation. In the upper all were lost by disease except two centrals 1. r. cuspid and 1st bl. Absorption of ridge very great and palatine arch very flat.



Sandwich Islander. 286.	50	m	2 $\frac{5}{8}$	2	2 $\frac{5}{8}$	17 $\frac{1}{2}$ , 1-16	None.	None.	The four lower molars retaining all or less all up, teeth traces below.	Very large incrustations on buc. sur. s. l. m's, some on more or less all up, teeth traces below.	78	The teeth of this skull very large, slightly abraded. All present at death, but a good many lost in preparation.
Sandwich Islander. 424.	50	f	2	134	2 $\frac{3}{8}$ , 1-32	134, 3-64	None.	1 r. s. m. socket walls necrosed.	Crown pit in l. r. 2 m.	None.	79	Teeth in upper jaw all lost in preparation except s. r. 2 m. In the lower jaw the third molars were not erupted. Teeth bluish white. Very little abrasion.
Sandwich Islander. 425.	45	m	2 $\frac{5}{8}$ , 1-32	2 1-32	2 $\frac{5}{8}$ , 1-16	2 $\frac{1}{2}$	None.	None.	Crown pits in a couple of lower molars.	Traces.	75	Teeth very perfect, abrasion of lower first and second molars, slight above. Arch broad and deep. Teeth of excellent structure.
Sandwich Islander. 428.	55	f	134 op 1 m's 2 $\frac{1}{2}$ , 1-32	134, 1 $\frac{1}{2}$	2 $\frac{1}{2}$ , 1 $\frac{1}{2}$	2	None.	Both s. 2 and 3 m's, l. r. 1 m., l. r. 2 and 3 m.	Buc. and labial cavities in all the lower teeth, only one carious tooth above	Traces.	76	Teeth appear good. Upper teeth abraded somewhat. It is remarkable that all the decay should be in the lower teeth and all the cavities at the gingival margin.
Sandwich Islander. 434.	60	f	2 $\frac{3}{8}$ , 1-16	2 1-32	2 $\frac{3}{8}$ , 1-16 Lower jaw doubtful, may not be long to the specimen.	17 $\frac{1}{2}$ , 1-16	None.	L. 1 1 bl.	None.	Buc. sur. sup. m's.	82	Teeth of upper jaw very good, fine, clean, very little abrasion. The lower jaw does not seem to belong to the specimen; only three teeth remain, the two molars deeply cupped.
New Zealander from Chatham Island. 1805.	65	f	2 $\frac{1}{4}$	134, 1-32	2 $\frac{1}{2}$	134, 1-16	None.	See remarks.	None.	None.	74	Extensive necrosis involving the upper centrals, ridge all gone, extended into palate process of the superior maxillary penetrating the floor of the nose. Abrasion extensive. Teeth solid and white.
New Zealander from Auckland Museum, Auckland. 1943.	50	f	2 $\frac{1}{2}$ , 1-16	2 1-64	*	*	None.	Both sup. first molars	1 l. m. extensive as to cause abrasion, tooth remains much worn on the side of the root.	Traces.	73	Teeth all present at death except s. r. 1 m. Abrasion very extensive. Bicuspids very large. Molars smaller in proportion, arch deep. Lower jaw missing.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
New Zealander from Auckland Museum, Auck- land. 1940.	60	f	2 3-32	134	*	*	None.	Extensive necrosis from 2 bl. back, inclu- sive of all m's on left side.	1 and 2 m's right side.	None.	76	All teeth lost in preparation except the molars on left side and the cen- tral incisors, which were evidently lost by abscess. Lower jaw missing.
New Zealander of the Maori tribe, from Chatham Is- land. 1804.	35	m	2 1/2	2 1/4	2 1/2, 3-16	2 3-32	None.	None.	None.	Buc. sur. sup. m's.	74	Very strong teeth, molars large, ex- cepting the third molars, which are very small. Palatine arch very deep.
New Zealander from Auckland Museum, Auck- land. 1942.	60	m	2 1/2, 1-32	2 1-32	*	*	None.	None.	None.	Traces.	77	Lower jaw missing. All teeth pres- ent at death; only four remain in the specimen. Extensive abrasion. Mo- lars very large.
New Zealander from Auckland Museum, Auck- land. 1938.	55	m	2 3-16 oppo- site middle of 2d m's. 2 1/2	1 1/2, 3/4	*	*	None.	Both r. bis. and left 1 bl.	None.	None.	73	Third molars either not erupted or lost during life, molars very large and square, extensive abrasion. Lower jaw missing.
Chinese. 958.	45	m	2 1/4, 1-32 op. 2 m. 28/8, 1-32	2 3-32	25/8 Taken from line where 3d m's would be.	134, 3-16	None.	None.	None.	Lines at gingival margin in sup. and out from bl. cusp. to bl. cusp.	79	Very large, white teeth, cusps prom- inent. Lines of black calculus, on the superior bicusps to molars, lingual surface; heavy, brown deposits on the lingual surfaces of the inferior in- cisors and cusps.
Chinese. 957.	45	f	2 1/4, 1-32 13/4, 3-16		2 1/2	13/4	Upper jaw very irreg. Incisors de- pressed; saddle- shaped arch.	None.	R. s. 1 m. crown. A-p. 1 l. 2 m.	Heavy de- posits on sup. r. m's.	80	Teeth apparently strong, bicusps large, molars not in proportion. In lower jaw all teeth back of 1st bicuspid lost during life.
Japanese. 916.	35	m	2 1/4, 1-16 17/8, 1-32		2 3/4, 1-32	13/4	None.	Both sup. 2 and 3 m's large ne- crosis of socket.	None.	Traces.	81	But few teeth remaining, all lost in prep. but sup. 2d and 3d molars. Im- paction of lower left 3 molars pointed inward.

Japanese.	779.	40	f	$2\frac{1}{2}$ , 1-16 op. 2 m's $2\frac{1}{2}$ , 1-16	$2\frac{1}{2}$ , 1-16	$2\frac{1}{2}$	$13\frac{1}{2}$ , $1\frac{1}{2}$ , 1-32	None.	L. 1. 2 m., I. r. 2 m., missing by disease.	1 s. r. m. I. r. 3 m.	Traces.	77	Teeth large, multi-cuspal, little or no abrasion, nearly all teeth present at death; some lost in prep.
Eskimo.	1189.	50	m	$2\frac{1}{2}$ , 3-32	$1\frac{1}{2}$ , 3-32	$2\frac{1}{2}$ , 1-16	2	None.	None.	None.	Traces.	75	Teeth medium sized, solid, square and largely abraded. Superior arch broad and deep, outer curve rounded.
Eskimo. Inch.	Old spec- 1186.	35	m	$2\frac{1}{4}$ , $1\frac{1}{2}$	$13\frac{1}{2}$ , 3-32	$2\frac{1}{2}$ , $1\frac{1}{2}$ , 1-16	$13\frac{1}{2}$ , $1\frac{1}{2}$ , 1-32	None.	None.	None.	Traces.	74	Teeth all present at death—five only remaining from which the others are judged. Abrasion not present in them; molars small.
Eskimo.	1184.	45	f	$2\frac{1}{2}$	$13\frac{1}{2}$ , 3-32	$2\frac{3}{4}$	$17\frac{1}{2}$	None.	Not de-terminable	None.	Traces.	77	Nearly all present at death—only four remaining; great abrasion. Teeth of good structure. A partial plate of vulcanite found with the skull, evidently worn as a fetch.
Eskimo.	1188.	30	f	$2\frac{1}{4}$ , 1-16	$13\frac{1}{2}$ , 1-32	$2\frac{5}{8}$	2	None.	None.	None.	Traces.	73	All teeth present at death. Sup. m's extensively abraded, lower not good structure. Old specimen.
Eskimo.	1196.	60	f	$2\frac{3}{8}$ , 1-16	2	$2\frac{1}{2}$ , 1-16	$17\frac{1}{2}$	None.	None.	None.	Traces.	79	Teeth average size, good structure, very extensive abrasion on the teeth remaining. All were in at death. Lost in preparation.
Eskimo.	1190.	60	m	$2\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$ , 1-16	$2\frac{1}{2}$ , 1-16	None.	None.	None.	Rings on sup. m's buc. surf.	75	Teeth very large, solid and yellow. Upper teeth extensively abraded. All present at death, but not all present in the specimen.
Australian, pro- nathism very great. 2771.	20 about.		f *	$2\frac{1}{2}$ , 1-16 op. 2 m. $2\frac{1}{2}$ , 1-16	$2\frac{1}{4}$ , 1-32	$2\frac{1}{4}$ , $1\frac{1}{2}$ , 1-16	$2\frac{1}{2}$	None.	L. r. 2 bl.	In the deciduous teeth remaining one or two plts.	Traces.	73	Teeth very long and well developed. The s. l. r. m. deciduous tooth still remaining, as is the l. r. m. deciduous. Permanent m's very large and square, one 3d m. erupted is rudimentary, judging from the very small socket.
Australian; s e x doubtful.	2767.	70	f ?	$2\frac{1}{2}$ , 1-32	$13\frac{1}{2}$	$2\frac{1}{2}$ , 1-16	$13\frac{1}{2}$ , 1-16	None.	Not de-terminable	Some slight in 2 or 3 sup. m's.	Large in- crustation on sup. m's buc. surf.	75	Lower molars gone long before death, as well as were up. Inc. and cusps, molars remaining show very great abrasion, teeth solid and polished by wear. These three Australian are not catalogued, and age, angle, etc., are determined by myself.
Australian.	2770.	30	m	$2\frac{1}{2}$ , 3-32	$2\frac{1}{4}$	$2\frac{1}{2}$ , $1\frac{1}{2}$ , 1-16	$2\frac{3}{4}$ , 1-16	None.	None.	None.	Traces.	77	Teeth very large, white and well developed. Third molars about as large as the others, lower nearly so; abrasion very slight.

\* The superciliary ridges characteristic of sex being well marked in male, not in female.



## SERIES II.

RACE.	Age.	Sex.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER-AL.	ANTI-POST.	LATER-AL.	ANTI-POST.						
Alaskan Indian. 2898.	40 ? m	?	2 1/2, 1-16	2	2 5/8, 1-16	2 1-16	Superior centis slightly crowded.	None.	None.	Light rings	70	Teeth very good. Abrasion not unusual at this age. The teeth are small. Lower 3d m's well developed; upper very small. Supernumerary inc. between the sup. incisors in line.
Alaskan Indian.	50 ? m	?	2 1/2, 1-32	2 1-16	2 5/8	2 1-16	None.	Extensive necrosis of s. l. 1 m.	None.	Traces.	70	Teeth large and square. Molars cupped. Anterior teeth worn about 1/2 their crown length. Specimen not catalogued. Arch broad and deep.
Alaskan Indian. 2890.	25 ? m	?	2 5/8, 1-16	2 3-16	2 1/2, 3-16	2 1-16	None.	None.	P, D, lower l. 2d bl.	Traces.	72	Teeth very good structure; slightly abraded. Teeth very white, due probably to bleaching process.
Alaskan Indian. 2394.	50 ? m	?	2 1/2, 3-16	2 1-16	2 3/4	1 7/8, 1-16	None.	None.	None.	Traces.	69	Teeth very large, square and dense. Teeth abraded about 1/3 of their length. S. R. 3d molar, four roots, left 3 roots. Lower right 4 roots—left 3 roots.
Oregon Indian Salish, from Puget's Sound. 69.	65 m	m	2 1/4	2 7/8, 1-32	2 1/2, 1-16	1 7/8	None.	None.	None.	Traces.	70	Time-worn specimen. Teeth all present at death. Very extensive abrasion. Sup. 3d m's two roots each. Arch of normal depth.
Oregon Indian, from Pistol River. 1631.	60 m	m	2 5/8, 1-16	2	2 1/2, 1-16	2	None.	Two or three of the molars above, from abrasion.	None.	Rings around the teeth.	73	Very extensive abrasion past the gum line. S. 1. 3 molars three roots; lower third molars two roots each. Weather-beaten specimen. Bones desicated. Arch very deep.
Oregon Indian, from Cascades of Columbia River. 265.	30 f	f	2 1-16	1 3/4	Miss ing.		None.	None.	None.	None.	72	Third molars not erupted. Teeth all present at death, lost in preparation, those remaining, good. Abrasion very slight.
Modoc Indian. 1021.	40 m	m	2 1/4, 1-16	2	2 5/8, 1-32	1 7/8, 1-16	Sup. incisors lapped.	None.	None.	Rings around nearly all the teeth.	71	Teeth very good, dark blue. Anterior teeth abraded 1/2 their length (the lower). Lower right 3d m. well developed, left one very small; both Sup. 3 m's small. Arch very deep.
Modoc Indian. 1020.	40 m	m	2 1/4, 1-16	1 7/8, 1-16	2 1/2	2	Sup. incisors slightly lapped.	None.	None.	Evidence of large bucc. and inf. lingual accretions.	69	Teeth small, dense and bluish. Abrasion slight. Sup. 1. 1. incisor has a lingual cusp very large and well marked, looking something like a bleuspid.

Nez Perce Indian, Montana Ty.	65 ? m	25/8, 1-32	2 1-16	25/8, 1-16 17/8, 1-16	None.	Central Incisors and both lower 2 and 3 molars gone during life.	L. 1.1 m. a. p. 1.1. 2 bl. pp,	Traces.	75	Teeth very large and dense. Extensively abraded. Lower lateral measure made from an imaginary point at probable location of third molars. Arch very deep. Alveolar strong. Extensive abrasion.
Nez Perce Indian, Montana Ty. 262.	65 m	21/8	17/8, 1-16	25/8, 1-16	None.	Extensive necrosis of half a doz. molars sockets above and below.	None.	There were large accretions on the molars.	71	Very great abrasion. Those lost by abscess caused by abrasion. Teeth very good structure originally.
Watlala Indian, from Cascades of Columbia River. 226.	35 m	23/8	17/8, 1-16	Miss ing.	None.	None.	None.	Broad black rings all around the molars.	63	Teeth small, good structure. Abraded past the enamel junction.
Watlala Indian, from Cascades of Columbia River. 227.	40 m	23/8	17/8, 1-16	Miss ing.	None.	None.	None.	Rings on the buc. surf. of molars.	61	Teeth all present at death. A few molars only remaining, quality good. First molars deeply cupped. The other teeth must have been considerably abraded.
Cowcow Indian, from Round Valley, California. 807.	35 f	21/8, 3-32	2	23/8, 1-16	None.	None.	None.	Traces.	73	Teeth small, white and dense. Teeth all present at death, but 8 left in the specimen. Horseshoe arch.
Cowcow Indian, from Round Valley, California. 812.	45 m	21/4	17/8, 1-16	17/8, 1-32	None.	None.	P. p. sup. 2 molars ap. 1. r. 1 m.	Traces.	74	Molars extensively abraded, teeth all present at death, all gone but 4 molars. Arch broad and flat.
Newitsee Indian, from Van Couver's Island. 762.	30 f	23/8	2	Miss ing.	None.	None.	None.	Rings around the molars.	73	Third molars not erupted. Teeth of good quality. Arch regular. No abrasion.
Newitsee Indian, from Van Couver's Island. 763.	60 m	23/8, 3-32	21/4	Miss ing.	None.	None.	None.	Traces.	71	Teeth good. All present at death; all but two lost in preparation. Abrasion must have been extensive. The left 3d molars had five distinct roots. The right had three. Bone well nourished. Arch not broad or deep.
Peel River Indian, from Fort McPherson 324.	55 m	23/8, 1-16	2	25/8, 1-16 2 1-16	None.	None.	None.	Large deposits on buc. surf. upper and lower molars.	73	Teeth very good, square and dense. Extensively abraded. Sup. third molars very small. Lower large and well-formed.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	FA.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Peel River Indian, from Fort McPherson.	55	m	2 $\frac{3}{8}$	2 $\frac{1}{8}$	2 $\frac{3}{4}$	2 3-32	None.	None.	None.	Large deposits on the buccal surf. upper and lower molars.	71	Teeth all present at death. Large and square. Extensively abraded. Superior 3d molars each have 3 distinct roots; lower have two.
Flathead Indian, from Chenook burial place, mouth of Columbia River.	55 ? m ?		2 $\frac{1}{2}$ , 3-32	1 $\frac{1}{8}$ , 1-16	2 $\frac{1}{2}$ , 1-16	1 $\frac{7}{8}$	None.	None.	None.	Traces.	63°	Teeth very good structure. All present at death. Very extensively abraded. Arch very deep.
Flathead Indian.	65 ? m ?		2 $\frac{3}{8}$	2	Miss ing.		None.	None.	None.	Traces.	76°	Teeth all present at death, six only remaining. Worn to gum line. Right 3d molar, three distinct roots, and 2 on the left 3d m. Arch deep.
Peruvian Indian, from the mountains brachycephalic, probably deformed.	45 ? m ?		2 $\frac{1}{4}$ , 1-32	2 $\frac{1}{8}$	2 $\frac{3}{4}$ , 1-16	1 $\frac{1}{8}$ , 1-16	Lower cent. inc. very much depressed backward and all four more or less twisted.	None.	Extensive caries in up. and lower molars.	Rings around most of the lower teeth traces above.	84	Teeth very large and well-formed. Abrasion extensive. Most of the teeth stained brown. Arch very deep.
Peruvian Indian.	55 ? m ?		2 $\frac{1}{8}$	1 $\frac{7}{8}$				None determinable	A. p. l. r. 1 m.	Traces of rings around m's and bl.	76°	Teeth nearly all present at death. Very extensively abraded. The anterior teeth gone to gingival margin. Arch broad and flat. Lower jaw don't belong to specimen.
Gros Ventre Indian.	40	m	2 $\frac{1}{4}$ , 3-32	2 1-16	Miss ing.		None.	None.	None.	Not determinable.	76°	Teeth all present at death, only 3 remain, showing good structure, and abrasion more than usual at this age. Arch flat.
Gros Ventre Indian, from a grave yard on the Upper Missouri River.	25	m	2 $\frac{3}{4}$ , 1-16	2 1-16	Miss ing.		None.	None.	None.	Mere traces	71°	Teeth very large. Cusps well developed. Abrasion very slight. 3d m's not erupted. Square and dense teeth, bluish cast.
Aztec Indian, from an old ruin near Cape Verde, Arizona Territory.	40 ?	m	2 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{5}{8}$	1 $\frac{7}{8}$ , 1-16	None.	Not determinable.	A. p. l. r. 2 bl.	Traces.	76°	Round, regular arch, deep. Nearly all teeth present at death. Teeth good, abrasion about what it would be at 40 years. Age not given in catalogue.



Aztec Indian, (from the ruins of Mesa-Horoses), near mouth of Rio de las Animas. 1843.	35	f	2 1/4, 1-16	2	2 3/8	1 7/8	None.	None.	Buc. surf. up, m's and rings around lower m's and bicuspids.	76	Teeth small, greatly abraded for this age, apparently indicating a more advanced age than in the catalogue. Arch very deep.
Nevada Indian. 1667.	50	f	2 1/4, 1-16	1 3/4, 3-32	2 3/8	1 5/8, 3-32	None.	None.	Buc. deposits on the up. and lower molars.	75	Teeth small, dense, extensively abraded. Teeth all present at death, and nearly all in the specimen.
Nevada Indian. 1654.	55	m	2 1/2	2	2 1/4, 3-16	2 1-32	None.	None.	Large deposits on sup. and inf. molars and rings on all the teeth.	70	Teeth square and larger than in 1667; extensively abraded. The upper and lower 3d molars almost as large as the others. Arch very deep.
Yankton Sioux, from Dakota. 493.	45	f	2 1/2	2 1/8, 1-32	2 3/4	2 1-16	None.	A few crown pits in lower molars.	Traces.	72	Teeth large and strong. Abrasion not what would be expected at this age, some teeth present in the specimen do not belong to it. Arch broad and deep.
Yankton Sioux, Fort Randall, D. T. 495.	25	f	2 5/8	2 1/4	2 3/4, 1-16	2 1/8	None.	None.	Traces.	70	Teeth all present at death, some in specimen do not belong to it. Teeth average size. Third molars are large and well developed. No abrasion.
Yankton Sioux, from Cheyenne Agency, D. T. 1789.	35	m	2 7-16	2 1-16	2 5/8	2 1/8	None.	None.	Traces.	68	Teeth all present at death. Molars very large and dense, yellowish white. Arch deep. Abrasion slight.
Ogallalla Sioux Indian, "Shota," chief of the Ogallallas. 199.	60	m	2 1/2, 1-16	2	2 3/4, 1-32	2	None.	None.	Traces.	74	Teeth all present at death. Some lost in preparation. Molars very large, square, dense. Third molars below fully as large as the others; the upper ones probably so. Abrasion extensive. Arch flat.
Ogallalla Indian. 481	50	f	2 5/8	2 1/8, 1-32	2 5/8, 1-32	1 7/8, 3-32	None.	Extensive necrosis of 1 2d m. l. and part of 3d m. l. l.	Large deposits on molars.	76	Nearly all present at death. Some teeth in the specimen do not belong to it. Extensive abrasion, teeth large and square. Third molars large as others. Arch broad and deep.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Piegan Indian, From Missouri Riv- er Blackfeet Nation 128	70	m	2 $\frac{1}{4}$ , 1-32 op. 2 m. 2 $\frac{3}{8}$ , 1-16	2 $\frac{1}{8}$	2 $\frac{3}{4}$ , 1-16 1 $\frac{3}{4}$ , 1-16	1-16	Upper jaw saddle- shaped. Bicuspid twisted. One stands ant. post.	None.	None.	Traces.	72	Teeth all present at death save the third molars; not large, good struc- ture, abrasion not so extensive as age would indicate. Arch very deep.
Piegan Indian, Blackfeet Nation. 868	65	f	2 3-16	1 $\frac{7}{8}$	2 $\frac{5}{8}$ , 1-16	2	None.	None.	None.	Traces.	77	Teeth all present at death. A good many lost in preparation. Good qual- ity, dense. Extensive abrasion.
Brule Sioux. Bea- ver Creek, Nebras- ka, near Camp Sheridan. 1911	45	f	2 $\frac{1}{2}$ , 1-16 1 $\frac{7}{8}$ , 1-16	1 $\frac{7}{8}$ , 1-16	2 $\frac{1}{2}$ , 1-16	2	None.	None.	None.	Traces.	69	Beautiful teeth, strong, dense. Lower third molars almost as large as others. Arch very deep. Abrasion not great on incisors. Molars cupped.
Brule Sioux. 502	40	f	2 $\frac{5}{8}$	2 3-32	2 $\frac{5}{8}$	2	None.	None.	None.	Slight traces.	70	Teeth all present at death. Very few lost. Teeth medium to small, very clean. Incisors above and below very wide at cutting edge; con- tracted at necks. Abrasion nil. A fourth molar in line on sup. left side. Socket small and tooth lost.
Mandan Indian, from Fort Berthold D. T. 316	18	m	2 $\frac{3}{8}$	1 $\frac{3}{4}$ , 1-16	Missing.		Lateral in- cisors when erupted would be back on the palate.	x	x	x	80	Very young specimen. Age not over 8 years. Catalogue wrong. The only permanent teeth erupted are the cen- tral incisors and first molars. The two second temporary molars have four roots each—two pal. two buc.
Mandan Indian, from Fort Berthold D. T. 136	75	f	2 3-16 op. 2 m. 2 $\frac{1}{2}$	1 $\frac{7}{8}$	Missing.		x	x	x	x	74	The few roots remaining ground off to process. Large exostoses of the cusp and bicuspid roots on left side; smaller on the right. Exostoses prob- ably a result of the abrasion.
Kaw Indian, near Smoky Hill River, Kansas. 151	50	f	2 $\frac{1}{2}$	2	2 $\frac{1}{2}$	2	None.	None.	None.	Rings around the molars.	68	Teeth average size, yellow, dense. Abrasion about normal. Arch deep. All teeth present at death—about half lost in preparation.

Kaw Indian. 152	50	m	2½	1-32	2	1-16	25⅞	1-16	2	Lower incisors crowded forward of the cusp. Upper molars and bl. zig-zag.	Not determinable. Several m's lost by some disease.	None.	Rings around nearly all the teeth.	70	Teeth good. Upper jaw saddle-shaped. Molars and bicuspids follow no line—in and out alternately. Arch very deep. Abrasion normal.
Arapahoe Indian 669	35	m	2½	1-16	17⅞	2½	1-16	17⅞	None.	None.	None.	Rings around nearly all the teeth.	78	Teeth small, yellow, dense, Abrasion very slight. Lower third molars large and well developed. Upper small. Upper arch ragged. Alveolar ridge exostosed.	
Arapahoe Indian 667	30	m	2½	3-32	17⅞	1-16	2¾	17⅞	3-32	None.	None.	Deposits on sup. molars and traces on lower.	73	Teeth very good, average size, Abrasions slight. Upper third molars impacted, pointing forward against root of second molars, causing absorption of root of second molar. Lower right third molar impacted, pointing forward against second molar. No absorption.	
Wishtaw Indian. 511	50	m	2¾		2	2½	17⅞	1-16	None.	None.	None.	Rings around all the teeth.	73	Teeth small, dense, regular, Abrasion normal at this age. Arch very deep. Lower third molars fully as large as the others. Upper smaller than others.	
Wishtaw Indian. 154	50	f	2½	2	1-16	25⅞	1-32	2	None.	Crown plts in molars ap. s. 1. 1 m. p. p. s. 1. 2 bl. molars all grayish-brown.	None.	Traces.	73	Teeth fairly good. First molars large—others not. The lower third molar as large as the other teeth. Abrasion normal. Molars and bicuspids grayish brown. Atrophy. Arch very deep.	
Winnebago Indian. 346	45	f	2¾	1-16	1¾	1-16	2¾	1-32	1¾	1-16	None.	Traces.	82	Teeth small, fair quality—all present at death. All lost in lower jaw except one molar. Arch deep and broad. Abrasion of anterior teeth extensive.	
Winnebago Indian. 360	65	m	2½	2	1-32	2¾	1-16	2	None.	Not determinable. Two teeth lost during life.	None.	Rings around the molars.	77	Teeth all present at death but upper left second and third molars. Very much abraded. Weather-beaten specimens. Teeth evidently of good structure.	



RACE.	AGE.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
		LARER-AL.	ANTI-POST.	LATER-AL.	ANTI-POST.						
Dakota Indian, from Fort Pierre. 300	40	2 $\frac{1}{2}$ , 1-16	1 $\frac{7}{8}$	2 $\frac{5}{8}$	1 $\frac{7}{8}$	None.	None.	L. 1. 3 m.	Traces.	73	Teeth all present at death—all upper lost in preparation, and all the lower anterior. Extensive abrasion. Lower third molars large and well developed.
Dakota Indian, from Fort Pierre. 304	40	2 $\frac{1}{2}$ , 1-16	1 $\frac{7}{8}$ , 1-16	Miss ling.		None.	None.	None.	Traces.	74	Teeth all present at death—only four molars left. Large, slightly abraded, bluish. Third molars small.
Crow Indian. 884	50	2 $\frac{1}{8}$ , 1-32	2 3-32	2 $\frac{5}{8}$ , 1-16	2 3-32	None.	Extensive necrosis of upper left side at Ir. 1 m.	None.	Large deposits on lower molars.	75	Teeth very large, square, dense; very much abraded. Lower third molars very large, and well developed. Teeth in the lower jaw all present at death.
Crow Indian. 173	45	2 $\frac{3}{8}$ , 1-16	1 $\frac{7}{8}$ , 1-16	2 $\frac{3}{4}$	1 $\frac{3}{4}$ , 1-16	None.	Lower 3 m. 2 m's on right side.	None.	Rings around the teeth above and below.	74	Teeth very good structure; large, very extensively abraded. Arch very deep.
Wahpeton Sioux. 1991	30	2 $\frac{3}{8}$	2 1-16	2 $\frac{3}{4}$ , 3-32	2 3-16	None.	Sup. l. 1 m. No necrosis	S. l. 1 m. completely gone. Hol- low roots. Crown pits in upper and lower molars.	Large deposits on nearly all the lower teeth. Traces above.	77	Teeth very large—molars especially so. Lower right third molars larger than average molar. Teeth whitish blue.
Wahpeton Sioux, near Fort Sisseton, D. T. 1919	18	2 $\frac{1}{4}$ , 1-16	1 $\frac{7}{8}$	2 $\frac{5}{8}$	1 $\frac{3}{4}$ , 1-16	None.	None.	None.	Rings around the molars.	79	Teeth small, stained brown. Third molars not erupted. Arch flat. Teeth all present at death. Anterior above and below lost in preparation.
Caddo Indian. 518	35	2 $\frac{3}{8}$ , 3-32	2 1-16	Miss ling.		None.	None.	None.	Traces.	76	Teeth large, square, dense, bluish-white. Cusps well developed. Abrasion slight. Arch very deep.
Caddo Indian. 519	45	2 $\frac{1}{4}$	2	Miss ling.		None.	None.	None.	Traces.	78	Teeth all present at death. Anterior gone in preparation. First and second molars large. Third molars much smaller. Molars somewhat cupped. Bicusps and anterior teeth abraded one-half their length. Arch very deep.

Kechi Indian. 523	40	m	2 3-16	2 1-32	2 $\frac{5}{8}$	1 $\frac{7}{8}$	None.	None.	Deposits on buccal molars.	74	Teeth all present at death except third molars, which did not erupt. The lower can be seen in their sockets. Molars very large, cusps well developed. Abrasion slight.
Kechi Indian, "Keeche - Kosk," chief of the Kechi. 863	50	m	2 $\frac{1}{2}$ , 3-32	2 $\frac{1}{8}$	Miss lng.	L. 2 inc. stand ant. post.	None.	None.	Evidence of large deposits.	79	Teeth large, square and dense. Third molars very small in comparison. Arch broad and deep. Extensive abrasion of the anterior teeth.
New Mexican Indian. 133	35	m	2 1-16	1 $\frac{3}{4}$ , 1-16	2 $\frac{1}{2}$ , 3-32 1 $\frac{5}{8}$ , 3-32	x	x	x	x	79	Specimen filled with teeth that do not belong to it. Arch V-shaped and very deep.
Choctaw Indian. 717	30	f	2 $\frac{3}{8}$	2 1-16	2 $\frac{5}{8}$ , 1-16 2 1-32	None.	None.	Crown pits in molars. Both 3 m. decayed beyond the pulp chamber.	Large deposits on buccal molars.	76	Teeth all present at death. Only the molars and one bicuspid left. Lower first molars very large. Lower third molars large. Teeth badly stained. No abrasion.
Lipan Indian, "Castaltie," Little Sack. 1001	50	m	2 $\frac{1}{4}$ , 1-16 op. 2 m. 2 $\frac{7}{8}$	2 $\frac{1}{4}$	2 $\frac{5}{8}$ , 1-16 1 $\frac{3}{4}$ , 3-32	x	x	x	x	68	Very old, dilapidated specimen. Time-worn. Only three teeth left. Extensive abrasion, but good quality. Arch broad and flat.
Tonkaway Indian 319	50	m	2 $\frac{1}{2}$ , 1-16	2 1-16	2 $\frac{3}{4}$	2 1-16	None.	None.	Large deposits on nearly all the teeth.	72	Teeth very large, square, dense. Third molars fully as large as other molars. Superior third molar has four roots. Extensive abrasion of molars. Very extensive on anterior teeth. Arch broad and deep.
Iowaunkeno Indian. 575	35	m	2 $\frac{3}{8}$ , 1-16	2 1-16	2 $\frac{5}{8}$	2	None.	None.	Traces of rings.	71	Teeth all present at death. Anterior all gone in preparation. Arch deep. Abrasion normal at this age. Bluish-white. Third molars very small.
Chicasaw Indian. 309	40	m	2 $\frac{1}{2}$ , 1-16	2 $\frac{1}{8}$ , 1-16	Miss lng.	None.	None.	None.	Traces of rings.	81	Teeth large, square. Cusps well developed. Third molars of good size. Arch broad and deep. Abrasion very slight. Bluish-brown in color.
Shawnee Indian. 1007	50	m	2 $\frac{3}{8}$	2	Miss lng.	None.	None.	None.	Large deposits on molars.	77	Teeth all present at death. Large. Third molars large. Very extensive abrasion of molars. Quality good and dense.
Pottawatomie Indian, Nebraska Territory, found on the plains. 355	55	m	2 $\frac{1}{2}$	1 $\frac{7}{8}$ , 1-16	2 $\frac{3}{4}$	1 $\frac{7}{8}$	None.	None.	Traces.	74	Teeth all present at death. Only nine molars left, pretty well abraded. Good structure. Arch broad and deep. Bluish-white.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCSS.	CARIES.	CAL.	FA.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Kiowa Indian. 1003	45	m	2 $\frac{3}{8}$ , 1-32	2 1-16	2 $\frac{3}{4}$	2 1-16	Lower incisors lapped back and forward.	None.	None.	Traces of rings.	74	Teeth all present. Medium-sized, very white, due to bleaching. Very little abrasion. Cusps well developed. Arch very broad and deep. Lower third molars larger than first and second of same jaw.
Spokane Indian, near Benton City, Montana.	50	m	2 $\frac{5}{8}$	2 3-32	2 $\frac{3}{4}$ , 1-32	2 $\frac{1}{8}$ , 1-32	Lower incisors slightly lapped.	None.	Two or three crown pits in molars.	Lower incisors lingual surface.	71	Teeth very large. Lower 3d molars with five cusps each. Very little abrasion. Arch very deep.
Chehalis Indian from Gray's Harbor. 695.	55	m	2 $\frac{3}{8}$	1 $\frac{7}{8}$	Missing.		None.	Both 1st molars.	None.	Traces.	79	Teeth all present at death. Very extensively abraded past pulp chambers. Teeth of very good structure. Arch very deep.
Nisqually Indian from Puget's Sound. 224.	30	f	2 $\frac{3}{8}$	2 1-16	2 $\frac{5}{8}$ , 1-16	2 1-16	None.	None.	Crown pits in molars.	Traces.	64	Teeth very good. Slightly abraded. Sup. 3d molars three roots each. Lower 3d molars two roots. Arch flat.
Texan Indian. 551.	45	m	2 $\frac{1}{8}$ , 1-32	1 $\frac{7}{8}$	2 $\frac{1}{2}$ , 1-16	1 $\frac{3}{4}$ , 1-32	None.	Extensive necrosis of sockets sup. r. cusp. and lat. incisors labial and palate.	None.	Rings around nearly all the teeth.	78	Teeth small, lower molars somewhat cupped. Third molars very small in lower jaw, well developed above but triangular.
Tonkaway Indian. 1004.	55	m	2 $\frac{1}{4}$ , 1-16	1 $\frac{7}{8}$ , 3-32	2 $\frac{1}{2}$ , 3-32	1 $\frac{7}{8}$	None.	None.	None.	Traces.	76	Teeth all present at death, only a few left. Skull bleached, arch very regular and deep. Teeth small, abrasion normal at this age.
Wisconsin Indian, near Fort Wayne, Mich. 828.	40	f	2 1-32	1 $\frac{7}{8}$ , 1-16	2 $\frac{3}{8}$ , 1-32	1 $\frac{7}{8}$ , 1-16	Sup. right 2 bl. stands out post. in its long diameter.	None.	Prox. cavities in up. m's and bleusps.	Traces of rings.	75	Teeth small; sup. m's not erupted. Arch very deep. Teeth considerably abraded. Skull questionable. Possibly white.
Cree Indian, ex- humed near Hud- son's Bay. 1271.	50	m	2 $\frac{1}{4}$	1 $\frac{7}{8}$ , 1-16	Missing.		None.	None.	Ap. right 1 m.	Evidence of large deposits on molars buc. surf.	76	Teeth all present at death, only three molars left showing good quality, medium size, roots very divergent. 3d molars very small.



Kickapoo Indian. 1170.	30	m	2½, 1-32	2¼	2¾, 1-16	2 3-32	None.	None.	None.	Heavy rings around all the molars.	74	Teeth very large, square, dense, bluish white. Lower 3d m's very large and well developed. Upper 3d m's small. Arch broad and deep.
Arctekaree Indian. 2060.	18	m	2¾, 1-32	2 1-16	2¾, 1-32	17½, 1-16	None.	None.	None.	None.	76	Teeth small and well developed. Yellowish. Lower 3d molars impacted. Teeth all present at death. Some lost. Arch flat.
Menominee In- dian from Wiscon- sin. 77.	15	f	2 3-16	138	2¼	1¼, 3-32	x	x	x	x	83	Age not over seven years as none of the permanent teeth are erupted. Measurements made opposite the first molars which are still in the sac.
Digger Indian from California. 339.	35	f	2¼, 1-16	2 1-32	Miss	Ing.	x	x	x	x	76	Teeth all present at death. None remaining in the specimen.
Wintoon Indian from Waverille, California. 1548.	40	f	2¼	134, 1-16	Miss	Ing.	x	S. 1. 1 m. from abra- sion.	x	x	78	Teeth all present at death, lost in preparation, only the 1 s. 1. m. left, greatly abraded and abscessed, the abrasion is much greater than the age would indicate.
Assinibolne In- dian. 1264.	80	f	2 1-16 op. 2 m. 288	178, 1-16	2½, 1-32	2 1-16	None.	None.	None.	Traces.	72	Teeth small and white; good struc- ture. Abrasion very extensive. Arch flat. Sup. 3 m's gone in life and great contraction of heels.
Hare Indian, Fort Good Hope, Mackenzie River. 328.	35	m	2½	2 1-16	2¾	2½	None.	None.	None.	Large de- posits on the up. and lower mo- lars.	71	Teeth large, bluish white. Abrasion slight. All present at death. Lower 3d m's well developed. Upper small. Arch broad and deep.
Sallish Indian from Puget's Sound. 66.	10	f	2¼	1½	Miss	Ing.	None.	None.	None.	Traces.	75	Incisors not erupted. 2d molars not erupted. Measure made op. 2d molars. Very young specimen.
Challam Indian from New Dun- geeness, Washing- ton Ty. 1710.	10	m	2¾, 1-16	178	Miss	Ing.	None.	None.	None.	None.	70	Very young specimen. Permanent teeth would be very large. Lateral measurement taken op. 2d m's, which had not erupted.
Ancient Pueblo Indian. 1179.	18	m	op. 2 m. 2¾, 1-16 ant. post. op. 2 m.	134	2¼, 1-16 op. 2 m.	134	None.	None.	None.	None.	84	Young specimen not over twelve years of age; cuspids above and 2 bl. above not fully erupted. Teeth small. No abrasion. Good quality. Cusps well developed.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCISS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER-AL.	ANT. POST.	LATER-AL.	ANT. POST.						
Osage Indian, 509.	50	m	2 $\frac{3}{8}$ , 1-16	1 $\frac{7}{8}$	Miss ing.		None.	None.	None.	Traces.	76	Teeth all present at death, only three molars remain showing medium size, good structure; abrasion normal. Septa for three roots in each 3d molar.
Seneca Indian, 522.	50	m	2 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{3}{4}$ , 3-32	1 $\frac{7}{8}$ , 3-32	None.	None.	None.	Deposits on nearly all the teeth.	72	Teeth very large, square, dense. Extensively abraded. Arch very deep. Lower 3d molars very large and square.
Sisseton Sioux Indian from Fort Sisseton, D. T. 1797.	35	f	2 $\frac{1}{2}$ , 3-32	1 $\frac{7}{8}$	2 $\frac{3}{8}$	1 $\frac{7}{8}$	None.	None.	None.	Buc. deposits on up. m's and bicuspids. Rings around all the teeth.	75	All teeth present at death, about half gone in preparation. Little or no abrasion. Teeth, molars large, others small, bluish. Lower jaw contracted at heels.
Teton Sioux from Fort Peck, Montana Ty. 1793.	50	m	2 $\frac{5}{8}$	2	Miss ing.		None.	None.	None.	Mere traces	73	Teeth all present at death, the anterior missing. Yellowish white, strong, dense, molars cupped, abrasion not great for this age. Arch broad and flat. 3d molars large and nearly square. 3 roots each.
Ookla Pah Ute Indian, Walker Lake, Nevada. 1547.	50	m	2 $\frac{5}{8}$	1 $\frac{7}{8}$ , 3-32	2 $\frac{3}{4}$ , 1-32	1 $\frac{7}{8}$ , 1-16	None.	None.	None.	Couldn't say, teeth all broken off.	76	Old weather-beaten specimen. Very much desicated. All roots remaining, broken off. Very remarkable specimen in this, that on the sup. left side in proper alignment is a 4th molar of a single root, which unfortunately is gone. The socket is round and the tooth must have been small.
Pawnee Indian, 912.	35	m	2 $\frac{1}{2}$ , 1 $\frac{1}{8}$ , 1-32	2 $\frac{1}{8}$	2 $\frac{3}{4}$ , 1-16	2 1-16	None.	None.	None.	Large deposits around all the teeth.	70	Teeth large, dense, strong, bluish white. Lower molars large and square. Abrasion slight. Arch broad and deep. Up. R. 3d molars two roots with four apices.

White found near Fort Concho, Texas 893.	55	m	2 $\frac{5}{8}$	21 $\frac{3}{8}$	2 $\frac{5}{8}$ , 1-16	2	None.	None.	Rings around the teeth, black above on ling surf. molars.	77	Teeth small, compared with size of jaws. Arch broad and deep. Good quality; bluish white. No abrasion to amount to anything.
White.	60.	f	21 $\frac{3}{8}$ , 1-16	2 3-16	Miss ling.		None.	Two or three arrow-shaped cusps	Rings around nearly all the teeth.	77	V shaped arch. Prognathism very marked. Teeth large and cusps well developed. No abrasion.
White.	62.	m	2 3-32	134	2 $\frac{3}{8}$ , 1-16 15 $\frac{3}{8}$ , 1-32		None.	Crown cavities in m's above and below.	Traces of rings.	80	Teeth very small, all present at death, nearly all lost in preparation. White teeth; no abrasion. Arch very deep.
White.	59.	m	21 $\frac{1}{2}$	17 $\frac{3}{8}$ , 1-16	23 $\frac{1}{4}$	17 $\frac{3}{8}$	Up. and low. incisors crowded.	Both lower bicuspid decayed off to gum. crown cavities.	Rings around all the teeth.	78	First molars very large; 2d and 3d small. Teeth bluish white. Arch very deep. No abrasion.
Negro.	1880.	f	21 $\frac{1}{4}$	2 1-32	25 $\frac{3}{8}$	17 $\frac{3}{8}$ , 3-32	None.	Sup. inc. all have prox. cavities.	Rings around nearly all the teeth.	66	Teeth large and well - developed cusps, bluish. Arch very deep. Abrasion very slight. None of the four third molars present. Evidently not erupted.
Samoan Islander. 2750.	60	m ?	21 $\frac{1}{4}$ op. 2 m. 21 $\frac{1}{2}$	17 $\frac{3}{8}$ , 1-16	25 $\frac{3}{8}$	2 1-16	Lower incisors lapped.	Large crown and pp. in l. r. 2m, in several of the lower molars.	Large deposits on nearly all the teeth.	76	Teeth large and square. 3 m's very well developed. Abrasion not extensive. Must have been very large accretions of calculus, as alveoli are largely absorbed from the teeth. Arch deep.
Egyptian. Not catalogued. Locality and age of specimen unknown. 2613.	65 ?	f ?	21 $\frac{1}{4}$ , 1-16	134, 1-16	28 $\frac{3}{8}$ , 1-16 17 $\frac{3}{8}$ , 1-16		None.	None.	Deposits on the lower left molars.	78	Teeth all present at death, only two molars and one bicuspid remaining. Teeth small, square. 3 m. well developed. arch deep. Abrasion on teeth left is slight.
Gallo-Roman, found in excavation of the cemetery des Innocents, Paris. 2610.	60 ?	f ?	28 $\frac{3}{8}$	17 $\frac{3}{8}$	Lower jaw doubt ful.		Right Cuspid.	Ap. up. 1.1 m.	Deposits on the buccal surface of molars.	81	Third molars not present, possibly not erupted. Teeth small; cusps well developed. Abrasion very slight. Arch very deep and narrow at palatine roof.



RACE.	AGE	SEX	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	FA.	REMARKS.
			LATER- AL.	ANT. POST.	LATER- AL.	ANT. POST.						
Gallo-Roman 2612.	30 ? m ?		214	2	258	158, 1-16	None.	None trace- able as some sock- ets are filled with cement.	Two or three large prox. cavities in m. and bi. above and crown pits in molars.	Lingual surface of lower in- cisors.	74	Teeth small and white; fair quality. Some have been placed with a kind of cement and the sockets built up. The lower jaw is not touched in this way except for one molar.
Romano - British from a cemetery at Fritford, near Ox- ford, England. Time worn. 1161.	25	f	214	134, 3-32	238, 1-16	134, 1-32	All incisors lapped 3 m's above look to- ward the cheek.	L. 1 m. right side	Three cavi- ties at the neck of lower m's. and bi. and one above in molar.	Traces.	80	V shaped arch above; teeth small, little or no abrasion. Arch deep. Teeth stained by time. Lower right first molars lost by caries; roots re- main.

### SERIES III.—Mound Builders.

Arkansas M. B., from Tiller mound, Drew Co.	40 ?	m ?	284	2 1-16	Missing	Arch V-shaped.	None.	None.	Large buc. deposits on molars, and rings on all	Broken Too		Teeth large, square. Abrasion indi- cated an age of about 40 years. Arch V-shaped and deep. 3 m's large, es- pecially right; one with 4 cusps. One posterior and a tubercle in the center of the crown. Predication of a 4th posterior cusp on l. 3 m.
Arkansas M. B., to from Tiller mound, Drew Co.	45 50 ?	f ?	288, 1-16 178, 3-32		Too broken to me sur	None.	None.	One or two very minute crown cavi- ties in l r. m.	Only slight rings. Gingival.	81		Arch small and smooth. Teeth reg- ular, bluish, not extensively abraded. Medium size. All present at death. Over half lost. Sockets show 3 m's to have been large, with largest diamet- er transversely.
Arkansas M. B. 2180	50 ?	m ?	288, 1-32 178, 3-32		Missing.	None.	Left 2 m. lost in life.	Can't say, as only three teeth remain, showing no evidence.	None on the two or three re- maining teeth.	76		Arch small, teeth large and square. Molars deeply cupped. L. left 3 m. is only 5-16 of an inch long, root and all; laying in its socket transversely with crown pointing directly toward the palate.

Arkansas M. B., from Tiller mound, Drew Co. 2203	35 ?	f ?	23 $\frac{1}{2}$ , 1-16	2 1-32	Missing.	None.	None.	Buc. deposits on molars and slight gingival rings on others.	76	Arch round, regular, flat, not deep. Teeth all present at death. Nearly all lost. Septa for three roots on the 3 m's; sockets indicate large ones. Abrasion just beyond enamel junction.
Arkansas M. B., from Tiller mound, Drew Co. 2181	50 ?	f ?	21 $\frac{1}{2}$ , 1-16	2 1-16	Missing.	None.	Large p. p. s. 1.1 m. ap. s. 1.2 m.	Light gingival rings.	78	Teeth all present at death except s. 1.2 bl. Arch round, regular, well marked palatine ridge, not deep. Sockets for third m's very small and indicate one small, conical root. The teeth remaining indicate extensive abrasion.
Arkansas M. B., from Tiller mound, Drew Co. 2197	55 ?	m ?	21 $\frac{1}{2}$ , 1-16	21 $\frac{1}{8}$	Missing.	Sockets for supernumerary central incisors in median line between the normal central.	S. 1.1 bl.	Large buc. deposits on molars and bicuspids.	Too broken	Large, round arch, deep, alveoli at heels hypertrophied. Teeth all present at death. Sockets for 3 m's indicate small ones, compressed antero-posteriorly. Abrasion extensive, especially in anterior teeth.
Arkansas M. B., from Tiller mound, Drew Co. 2192	30 to 35 ?	f ?	21 $\frac{1}{2}$ , 1-16	2	Too broken to measure	S. 1.1 incisors depressed. Bicuspids first on right side pressed inward.	S. 1.1 m. all gone to gingival margin. Large crown cavity 1.1.2 m. Crown cavities in m's.	Traces of buc. deposits on superior m's.	Too broken	Arch regular, teeth nearly all present at death. Teeth small and bluish. Sup. 3 m's nearly as large as the 24 m's; lower 3 m's fully as large as 24 m's, and quadri-cuspal. L. 1.3 m. has three fused roots. Upper 3 m's also quadri-cuspal, though not as well marked as lower.
California M. B., from a mound near Centerville, Alameda Co. 2560	60 to 65 ?	m ?	23 $\frac{1}{2}$	2	17 $\frac{1}{8}$ , 1-16	None.	S. 1.1 m. negressed. Both lower cent. and lateral inc. gone in life. Possibly abscess.	Rings on nearly all the gingival margins.	76	Nearly all present at death. Great many left in specimen. Very extensively abraded; the lower obliquely toward the tongue. Yellow, dense. Arch very deep and long. Sup. 3 m's three roots each. Lower, two.
California M. B., Centerville, Alameda Co. 2565	70 to 75 ?	m ?	21 $\frac{1}{4}$	13 $\frac{1}{4}$ , 1-16	Missing.	None.	S. 1.1 and 2 m's; all the left m's.	Can't say.	67	The teeth, anterior to the molars, all present at death. None remaining in specimen. Arch flat.

RACE.	AGE.	SEX.	UPPER JAW. LATER- AL.	UPPER JAW. ANTI- POST.	LOWER JAW. LATER- AL.	LOWER JAW. ANTI- POST.	IRREG.	ABSCES.	CARIES.	CAL.	FA.	REMARKS.
California M. B., near Centerville, Alameda Co. 1957	45	m	2 $\frac{3}{8}$	2 $\frac{1}{8}$	Miss ling		Left inc. depressed with septa for semi- bifurcated root.	None.	None.	Large de- posits on buccal sur- face of molars.	75	Teeth all present at death. Anterior lost. 1 m's very large and square. 3 m's large, and septa for three roots. A supernumerary I. I. incisor standing directly in front of and between the left central and left lateral. The nor- mal central seems to have been semi- bifurcated.
California M. B., Centerville, Alame- da Co. 1958	55	f	2 $\frac{1}{4}$	2 $\frac{1}{8}$	Bro ken and part lost.		None.	S. I. 2 m., S. I. 1 m.	None.	Traces of rings.	72	Nearly all teeth present at death. Abrasion <i>very</i> extensive—worn away to gum line. Arch long and narrow; not deep. S. I. 3 m's not erupted.
California M. B., Centerville, Alame- da Co. 1959	60	f	2 $\frac{1}{8}$	2	Miss ling.		None.	S. I. 2 m.	x	x	79	Only three roots remain, worn to gum line. Arch long and narrow. Teeth were small.
California M. B., from Angel Island, from a shell mound 2084	65 ?	f ?	2 3-16	1 $\frac{3}{4}$ , 3-32	Miss ling. Jaw in spec- imen does not be long.		None.	S. I. 1 m. Extensive necrosis.	In teeth re- maining no evidence.	Large de- posits on molars.	Broken Too	Teeth nearly all present at death; <i>very</i> extensive abrasion—beyond gum line. Sup. I. 3 m. not erupted. Arch deep. Right 3 m. small.
California M. B., Alameda Co. 1956	75	m	2 $\frac{1}{8}$	1 $\frac{3}{4}$ , 1-16	Miss ling. The jaw accom p'nying spec imen does not bel ong.		x	x	x	x	71	Only two ant. roots remain; nearly all teeth lost in life. Arch flat and much absorbed.
California M. B., from Angel Island, to (On some tickets spelled Angle.) 2083	60 65 ?	f	2 $\frac{1}{8}$ , 1-32	1 $\frac{3}{4}$ , 1-32	2 $\frac{7}{8}$ , 1-32	2	None.	All three of lower r. m's Several up- per right look like it also.	None.	Evidence of large de- posits on nearly all	74	Very extensive abrasion of the upper teeth. Lower left 3 m. does not ap- pear to have erupted though the nearly closed sockets of the 3d. and 2 m's looks as though it might have. Arch long and narrow, flattened on the vault of palate.
California M. B., from a mound near Centerville. 419	13 ?	f ?	op. 2 m. 2 $\frac{1}{8}$	1 $\frac{3}{4}$ , 1-16	Miss ling.		Lateral in- cisors slightly de- pressed. Cusps prominent.	None.	None.	None.	80	Teeth all present at death; only the molars left. Large and white. Third m's present, but not erupted. Large crowns. Arch flat. This skull exhib- its an infra-central incisor. Socket round and small. Situated in the me- dian line directly in front of the cen- tral incisors.



California M. B., from a mound in Alameda Co. 1955	50	f	23/8, 1-16	2	25/8, 1-32 13/4, 1-16	None.	None.	A crown cavity in each of the lower 2d molars.	Buc. depos- its on the sup. molars	71	The third molars above and below give no evidence of ever having been erupted. Teeth (the others) all pres- ent at death. A good many lost in preparation. Large, square, and deep- ly cupped. The sup. 1 m's especially. Arch deep.
California M. B., from Ryan's mound Alameda Co. 1954	50	m	23/8	2 1-16	Miss ing.	None.	None.	x	x	73	All teeth present at death. None remain in the specimen. Third mo- lars very large, judging from the sock- ets. Each socket has septa for three roots.
California M. B., from a mound near Centerville. 417	60	m	23/8, 1-16 17/8, 1-16	23/4, 1-32 17/8, 1-16		None.	None.	None.	Large de- posits on buc. surf. sup. m's. Rings around other teeth	72	Teeth all present at death. Only a few lost, including anterior teeth be- low. Abrasion of sup. m's very exten- sive obliquely toward the palate. Lower teeth extensively abraded. Lower 3 m's large and well formed. Sup. smaller, with septa for two roots. Arch narrow, but very deep.
California M. B., from a mound on Angel Island. 908	55	m	21 1/2	2	2 1/2, 1-16	None.	None.	None.	Large de- posits on buccal surf. of m's and rings on the others.	75	Teeth all present at death. All 1st and 2d m's very large and square. The sup. 1 3 m. is the only one erupted. Small. Teeth yellow; abrasion above, obliquely toward palate; below toward the cheek.
California M. B., near Centerville. Found in a sitting posture. Alameda Co. 418	30	m	21 1/4	2	Lower jaw doubtful.	None.	Both 1 m's.	x	x	79	No teeth remain. All present at death. Evidence of abscess at both 1 m's. Arch long; vault flat.
Dakota M. B., from a mound eight feet below the sur- face, Devil's Lake Agency. 1735	70	m	25/8	Heel to max. pc- 2 1/4, 1-16	Miss ing.	None.	Both 1 m's necrosed; also right cusplids.	None.	Evidence of large de- posits.	68	Teeth nearly all present at death. Only five remain. Teeth were large— third m's large. Abrasion very exten- sive—probable cause of abscess. Arch very broad and deep. Teeth yellow. Right 3d m's, three distinct roots.
Dakota M. B., Mound near Sisseton. 1924	65	f	23/8, 1-16 13/4, 1-16	1-16	Miss ing.	None.	None.	None.	Deposits on buc. surf. m's.	72	Teeth all present at death. Three remain, showing good material. Abraded 1/2 their length. Bluish-white. Arch V-shaped; vault flat. Anterior left alveoli broken away.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ARCESS.	CARIES.	CAL.	FA.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Dakota M. B., from a mound eight feet below the sur- face, Devil's Lake Agency. 1662	60	f	2 1/4	2	2 1/2, 1-16	17/8, 1-16	None.	None.	L. 1. 3 m. crown cavi- ty.	Traces of rings.	70	Teeth all present at death. Anterior all gone above and below. Molars small, square, bluish-white. Abrasion does not indicate an age so great as 60; more like 50. Arch flat and round— horse-shoe-shaped.
Dakota M. B., from a mound eight feet below the sur- face, Devil's Lake Agency. 1650	60	m	2 1/2 op. 2 m. 2 3/8	2 1-32	27/8	2 1-16	None.	S. 1. 1 m. ex- tensive ne- crosis of alveolus.	None.	Rings around nearly all the teeth.	67	Teeth all present at death but one. About half remaining. Abrasion of sup. teeth extensive. Lower m's worn off most on buc. side, leaving the lin- gual higher. Teeth very large, dense, yellow. Arch broad and flat.
Dakota M. B., from a mound near Fort Totten. 1123	40	f	2 3-32	17/8, 3-32	23/8	2 1-16	None.	None.	None.	Large de- posits on m's, and rings on other teeth	72	Teeth all present at death. About half gone. Bluish-white. First m's large square; others small. Lower third m's large as 2d m's. Abrasion slight. Arches long and narrow. Pal- ate deep and flat at the vault.
Dakota M. B., from a mound near Fort Totten. 1122	60	f	17/8	13/4, 1-16	23/8, 1-16	13/4, 1-16	None.	L. 1. 1 m. necrosed; 3 m's all gone; prob- ably by ab- scess.	None.	Rings at gingival margin.	78	Very extensive abrasion. Teeth nearly all worn to the gum. Yellow. Must have been strong and dense. The 3d m's probably gone by abscess. Great contraction of heels of sup. max- illary ridges. Very high, bony ridge on median line of palate.
Dakota M. B., from a mound near Fort Totten. 941	45	m	2 1/2	2	Miss ing.		None.	None.	None.	Traces of rings.	Too broken.	Teeth all present at death. Only the 1st m's remaining. Large, square, slightly cupped, yellow. Third molars small. Arch broad—horse-shoe-shaped —not deep.
Dakota M. B., from a mound near Fort Wadsworth. 164	45	m	2 3-16	17/8	23/8, 1-16	17/8, 1-16	None.	None.	None.	Rings around the teeth.	72	Arch very regular, round, broad, deep. Teeth yellow, medium size. S. r. 3 m's socket is round, and less than 3-16 diam. L. 3 m. sup. not erupted. Lower 3 m's small and round. Abrasion slight.

Dakota M. B., from a mound near Fort Wadsworth. 163	10	Child	op. 2 m. 2 $\frac{1}{4}$	134, 1-16	Miss lng.	None.	None.	None.	None.	80	Only the first molars remain. Very large. Cusps well developed. The sup. right 2 bl. in its socket unerupted shows a minute supernumerary cusp on the buccal cusp, like an enamel module.
Dakota M. B., from a mound near Fort Wadsworth. 168	50	m	2 $\frac{1}{4}$ , 1-16	178, 1-16	2 $\frac{1}{2}$ , 3-32 178, 1-32	None.	L. l. 1 m. extensively necrosed alveolus.	None.	Traces of rings around nearly all the teeth.	74	Teeth all present at death save l. l. 1 m. Teeth very good structure. Yellow. Molars square. Sup. 3 m's very small. L. 3 m's small. Arch deep. Ant. post. ridge in medium line of palate.
Dakota M. B., from a mound near Fort Wadsworth. 170.	35	m	2 3-16	2	2 $\frac{1}{4}$ , 1-16	None.	None.	None.	Large de- posits on buc. surf. m's, rings on all other teeth.	73	Teeth all present at death—only the molars remain in lower jaw. Teeth small, cusps well developed. Lower 3 m's have 5 cusps, bluish white; abrasion slight, arch deep, flat at vault.
Dakota M. B., from a Tumulus near Fort Wadsworth. 167.	65	m	2 $\frac{1}{4}$ op. 2 m. 2 $\frac{1}{4}$ , 1-16	2 $\frac{1}{4}$	258	None.	S. l. 1 and 2 m's, l. r. 2 m. sockets necrosed.	None.	Traces of large de- posits.	73	Nearly all teeth present at death. Heavy, yellow teeth, extensively abraded. Sup. 3 m's probably not erupted, or if so, great absorption of heel of sup. arch; arch flat.
Dakota M. B., from a mound near Fort Wadsworth. 169.	55	m	258	178, 1-16 from heel of arch. 2 $\frac{1}{4}$	178, 1-16 258	L. r. inc. slightly twisted.	None.	None.	Rings on nearly all the teeth.	69	1st and 2d m's large, sup. 3 m's small, lower square large and well developed. Abrasion slight for this age in comparison with other specimens. Teeth dense, bluish white, all present at death. Some lost in preparation. One bl. don't belong sup. R. I bl.
Dakota M. B., from a mound near Totten. 940.	60	m	2 $\frac{1}{2}$ , 1-32	178	234, 1-32 134, 1-16	None.	S. l. c. and l. incisors.	None.	Large de- posits on buc. surf. molars; other rings.	73	Teeth all present at death but two. Average size, molars largely abraded. Anterior teeth about one-half their length; yellow, dense. Arch broad and deep; sup. 3 m's three roots each: lower, two each.
Dakota M. B., from a mound near Fort Totten. 942.	40	m	2 $\frac{1}{2}$ , 1-16	2 1-16	Miss sing.	Bicusplids depressed, saddle- shaped arch.	None.	None.	Traces of heavy rings	73	Teeth all present at death. Teeth very large, square, dense and yellow. Alveoli very large, extensive abrasion; 3d m's three roots.



RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Florida M. B. 2635.	60 ?	m ?	2 1/4	2 1-16	Mis sing.		None.	S. r. 1 m.	x	x	80°	Teeth all present at death, only one remains, a molar showing extensive abrasion and good quality, stained brown, arch flat and very shallow possibly due to post-mortem breakage. Sockets for 3 m's very small and but one root.
Florida M. B. 2634.	50 ?	m ?	2 3/8, 1-16	2 1/8	Mis sing.		All teeth more or less twisted out of position.	R. 3 m.	None.	Gingival rings on all teeth.	73°	Teeth all present at death but one and all are in specimen. Teeth flattened in front, making arch like a parallelogram; deep. Teeth strong and abraded one-fifth to one-fourth their length. Third m's very small.
Florida M. B. 1601.	60	m	2 3-16	2 1-16	2 3/4	1 3/4, 3-32	Bls. and 1 m's compressed to form saddle arch.	Extensive necrosis of sockets of r. 3 m. and l. 1, 1, 3 m. and r. 2 m. and sup. 1. at gingival margin of 2 and 3 m., and l. r. cusp.	Large a. p. buc. cav. 1. small cav. several at gingival margin of up, left side.	Evidence of large deposits on molars and gingival rings on other teeth.	75°	Teeth all present at death with three or four exceptions. Abrasion very extensive, molars large, lower 1-3 m. large and quadrangular; arch very narrow and deep; teeth yellow.
Florida M. B. 1593.	55	m	2 3/8	2	2 1/2, 1-16	2 1/8	Lower anterior teeth very much disarranged. Upper incisors also somewhat crowded.	None.	None.	Large deposits on all the teeth.	77°	All teeth present at death except the sup. 3 m's, did not erupt, teeth large, lower 3 m's large, all teeth more or less cupped, the lower m's especially; sup. arch V shaped, narrow and very deep; lower also V shaped and measures from the gingival margin to symphysis just two inches.
Florida M. B. 1109.	55	m	2 3/8, 1-16	1 7/8	Mis sing.		None.	L. 2 m. and probably also the 3 m.	None.	Very large buc. deposits on molars.	71°	All teeth present at death except possibly the left 3 m; abrasion very great and on an incline plane, starting from the buc. grinding surface and extending to the gum line on the palate on right side; arch regular and flat.

Florida M. B. 1107.	60	m	Too broken to measure.				Mis sing.	None.	None.	None.	Large deposits on all the teeth.	74	All present at death, only five remain showing dense, square teeth; good structure, molars cupped but abraded, not as extensive as age would indicate; arch narrow and very deep; 3 m's small.
Florida M. B. 1108.	50	m	2½	1¾, 1-16	2½, 1-16	1¾	None.	None.	None.	Evidence of large deposits on molars and gingival rings on all.	73	Teeth all present at death, medium size, 3 m's all small, especially the lower ones, which are about the size of bicuspid; molars all deeply cupped and worn away on an incline from out to inward above, and from inward to outward below. Arch regular and very deep and flat at vault.	
Florida M. B. 1599.	55	m	2¾, 1-32	2½	2½, 1-16	1¾, 3-32	None.	None.	None.	Large buc. deposits on the m's; rings on all the teeth.	73	Teeth all present at death; first m's large, 3 m's small, especially the upper. Abrasion extensive throughout the mouth; arch regular, deep and well nourished.	
Florida M. B. 1600.	40	m	2¾, 1-16	1¾, 3-32	2½, 1-32	1¾, 3-32	Lower incisors slightly lapped.	None.	None.	Heavy deposits on all the teeth.	74	Teeth all present at death except the upper 1. 3 m. and lower left 3 m., neither of which erupted; teeth small, abrasion slight, vault of arch flat, not deep; regular.	
Illinois M. B., Alexander Co. 2190.	45 ?	m ?	2¾	2			None.	None.	Crown pits in molars.	Gingival rings.	73	Teeth all present at death, only five molars remain. Fairly good quality, reddish blue, kind of atrophy stained. Arch broad and deep; molars not much abraded.	
Illinois M. B. 1012.	60	m	2 1-16	1¾, 1-16	2¾	1¾, 1-16	None.	S. l. c. and 1 bl. All molars on s. r. side gone in life.	P. p. s. l. 2 m., p. p. s. r. 1 bl., crown l. l. 2 m.	Evidence of large deposits on m's and bicuspid.	88	Lower 3 m's large; none present above; teeth look to have been of fair quality. Palatine arch flat at vault, not deep; abrasion not extensive.	

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCISS.	CARIES.	CAL.	FA.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Illinois M. B., Claire Co.	45 to 2191. 50 ?	f ?	2 3-16	2 1/8	Very badly broken.		None.	S. r. 2 m. extensive necrosis s. l. 2. m.	S. l. 1 bl. decayed to the root.	Evidence of large de- posits.	Can't deter- mine, too broken.	First m's large, square. The re- maining teeth well worn, solid, dense and yellow; arch broad and deep.
Illinois M. B., Alex- ander Co.	40 ?	m ?	2 3/8, 1-16	2	2 5/8, 1-16	1 7/8	None.	L. r. 1 bl.	None. Root of l. r. 2 bl. re- mains; looks like root of de- ciduous molar.	Gingival rings.	77	Teeth all present at death; 1. 3 m's large and well formed; upper also, they having three roots; the lower two; the other m's are small sized. Abra- sion not great, teeth yellow, arch broad and deep.
Illinois M. B., from Mill Creek, Alexan- der Co.	40 ?	m ?	2 3/4, 1-16	2 1-16	Mis sing.		S. l. 1 bl. forced out- ward, 2 bl. inward; s. r. 2. bl. dies in the pal- ate with the crown pointing forward, imbedded deeply in the palate.	None.	One crown pit in right 2 m.	Evidence of rings around the teeth.	Can't deter- mine, too broken.	Teeth very large, dense, heavy, yel- low; arch very broad and deep; 3 m's very large. Molar cusps well devel- oped, abrasion on molars slight, an- terior teeth show the most use.
Illinois M. B., from Pearl Depot.	not determinable about 55 to 50.	f ?	2 1/4	2	2 1/2, 1-16	1 3/4	None.	All lower right mo- lars lost in life; not de- terminable	Evidently none.	Traces of gingival rings.	Too broken.	Five molars remain in the up. jaw, very much abraded; lower ant. teeth gone to the roots. The sockets of the two sup. left bis. seem to have been extensively necrosed, the margins be- ing rounded; up. 3 m's two well-marked roots.



Illinois M. B. 2210.	25 ?	f ?	op. 2 m. 23½, 1-16	Broken at symph. asis; can't m. measure.	None.	None.	None.	None.	Too broken to determine.	Young specimen; up. 3 m's in process of eruption; the left teeth well developed but not large. Arch flattened at the vault; abrasion not much. Teeth of good structure, all present at death.
Illinois M. B., Carroll Co. 2621.	55 to 60 ?	f ?	Too broken to m. measure.	Mis sing.	None.	S. l. 1 and 2 m's.	Large p. p. s. l. 1 m., probable cause of abscess.	Evidence of rings.	Too broken to determine.	Only a few teeth left, but they show good structure. Extensive abrasion, yellow teeth; arch broad and deep, with median palatine ridge.
Illinois M. B. mound on a bluff at the mouth of the Illinois River. 2441.	60 to 65 ?	m ?	17/8 13/4	Mis sing.	x	x	x	x	73	Senile arch; two or three anterior teeth only present at death.
Illinois M. B., Alexandria, Union Co. 2209.	45 ?	m ?	23½, 1-16 17/8, 1-16	Only right side remaining.	None.	None.	P. p. sup. l. 2 m's.	Rings.	Too broken to determine.	Large teeth, only those on left side remaining; all present at death. Arch broad and deep; no evidence of extensive abrasion.
Illinois M. B., Alexander Co. 2188.	Not less than 55 ?	f ?	2 3-16 17/8	Mis sing.	x	x	x	x	76	No teeth; nearly all lost in life. Great absorption; arch very flat.
Illinois M. B., from a mound at Aurora. 993.	45	m	21/8 2 1-6 21/2, 1-16	21/2, 1-16 21/8	None.	L. l. 2 m.	None.	Heavy rings around all the lower teeth.	73	No teeth remaining in the upper jaw; the lower is full and shows the teeth well developed, square, dense and yellow; 3 m's large and well developed; abraded from one-fifth to one-fourth their length.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCSS.	CARIES.	CAL.	FA.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Illinois M. B., from a small bluff on Word River, Madison Co. 2204.	45 to 50	f?	Too broken to measure.		25 $\frac{3}{8}$	17 $\frac{3}{8}$ , 3-32	L. 1. molars zigzag.	x	x	Evidence of large deposits.	Can't determine.	Teeth very much abraded in lower jaw; upper jaw too demoralized to examine; one 2 m. remaining shows extensive abrasion.
Illinois M. B. mound on bluff at mouth of Illinois River. 2435.	80?	m?	17 $\frac{3}{8}$	13 $\frac{3}{4}$ , 1-16	21 $\frac{1}{2}$	11 $\frac{1}{2}$ , 1-16	x	x	x	x	79	Senile jaw, only a few anterior roots present at death; palate very flat.
Illinois M. B., from Union Co. (Rock mound, stone grave). 2198.	50?	m?	21 $\frac{1}{2}$	2	23 $\frac{3}{4}$ , 1-16	2	Sup. inc. lapped; right deciduous pressed to-ward the palate.	Possibly at the l. r. 1 m.	Lower I. first m's decayed off to the roots.	Evidence of large deposits.	81	Sup. teeth large, molars square, sup. right 3 m. never erupted as specimen broken at that point proves. Arch very deep. Somewhat compressed at the bleusplids. Abraded beyond enamel junction; molars cupped.
Indiana M. B. 1010.	50	m	23 $\frac{3}{8}$	17 $\frac{3}{8}$ , 1-16	Mis sing.		None.	None.	None.	Evidence of rings around the molars.	73	Teeth all present at death, not large; 3d molars very large for up. jaw, the left one fully as large as the 2d molar on that side. Dense, yellow molars, abraded obliquely inward; arch round, regular. Palate full but not unnaturally deep.
Indiana M. B., from a mound at Brown's Hill. 1011.	55	m	23 $\frac{3}{8}$ , 1-32	17 $\frac{3}{8}$	23 $\frac{3}{4}$	13 $\frac{3}{4}$ , 1-16	None.	None.	None.	Rings on nearly all the teeth.	82°	Teeth all present at death, stained brown. Abrasion extensive, first molars large and square, arch broad and raised in the medium line. The 3d molars in both jaws small.
Indiana M. B., from a mound 9 miles N. W. of La Fayette. 243.	55	m	27 $\frac{3}{8}$	23-16	Mis sing.		None.	x	x	x	72	Teeth all remaining at death, none remaining in the specimen. Alveolar ridge enormous at molars, roots all very large, the 3d m's each with three large roots—this is judged by sockets. Arch very broad and flat.
Indiana M. B., from a mound with large trees growing upon it, in Henry Co. 1008.	55	m	21 $\frac{3}{8}$	17 $\frac{3}{8}$	Mis sing.		None.	None.	Evidently none; the two teeth remaining are of the kind that don't decay	Rings on the molars.	73	Teeth all present at death, only the first molars remain, not large, yellow and pretty well cupped. The 3d molars never erupted. Arch regular and not deep.

Iowa M. B., from Oak Tree mound 1049.	50	f	23 <sub>8</sub> op. 2 m. 2 1/2	2	25 <sub>8</sub>	21 <sub>8</sub>	S. r. i. inc. depressed toward the palate: l. i. 1 inc. twisted out. post.	None.	None.	Evidence of large de- posits on all the teeth.	78°	Teeth all present in specimen; lower m's large, 3 m's below very large and well developed, upper small; arch very broad and deep, teeth yellowish, abrasion not extensive.
Iowa M. B., from the Albany mounds 1048.	65	m	2 3-16	17 <sub>8</sub>	27 <sub>8</sub>	17 <sub>8</sub>	Not de- terminable	Not de- terminable	From ex- isting roots would say none.	Rings.	71°	Only a few roots left at death above; great abrasion, great absorption of al- veolus; seven teeth remain in the lower jaw; great abrasion, crowns all gone, palate flat.
Kentucky M. B.	735	f	21 <sub>8</sub>	2	23 <sub>8</sub> , 1-32	15 <sub>8</sub> , 1-16	Lower r. i bl. leans back & touches 1 m 2 bl. gone in life.	s. left 3 m.	pp. l. r. 1 m.	Traces of gingival rings.	74°	Below only the anterior teeth were present at death, though one molar remains; above nearly all present at death; the teeth extensively abraded; S. right 3 m. did not erupt; teeth, yel- low and of good structure; arch deep.
Kentucky M. B.	734	m	2 1-16 op. 2 m's 2 1/2, 1-16	17 <sub>8</sub>	27 <sub>8</sub>	13 <sub>4</sub> , 1-32	None.	All the l. i. m's gone in life; look like abscess cusplids.	Large ap. l. r. 3 m.; ap. in & pp. l. i. 1 bl. both sup.	Evidence of large depos- its on nearly all the teeth	79°	Of the teeth remaining some show extensive abrasion, while others only past enamel junction. The sup. 3 m's don't appear to have erupted; the lower right 3 m. is large, with well devel- oped cusps; the lower right cusps ap. & 1 bl. ap. cavities.
Kentucky M. B.	736	m	21 <sub>4</sub>	2 3-32	23 <sub>4</sub> , 1-16	17 <sub>8</sub>	None.	Both lower 2 m's both s. i. bl.	The four sup. bl. v'ry extensively decayed, p. p. i. l. i. m.	Evidence of large buc. dep. on sup m's; rings on nearly all.	80	Sup. 3 m's never erupted; can't say as to lower, as all the molars except one were lost in life and bone smoth- ered over with compact tissue; very extensive abrasion; molars very large; arch very deep; the anterior teeth worn away to gum line.
Kentucky M. B.	737	m	25 <sub>8</sub> , 1-16	2 1-16	27 <sub>8</sub> , 1-16 lower jaw d'nt belong to spec- imen.	2	Bl. depres'd saddle- shaped arch.	None.	A few cro'n pits in m's & right bl- cusplids.	Traces of gingival rings.	too bkn	Teeth medium size; no abrasion; 3 m's with three roots each; arch very deep; teeth bluish, and on buccal sur- face of molars softening had begun for decay.
Kentucky M. B.	738	m	21 <sub>8</sub> , 3-32	2	23 <sub>4</sub>	2	Sup. left, 2 bl. small, round and crowded; teeth all packed closely together.	None.	None.	Large lln- gual deposits on all the l'w teeth; slight rings above	74°	Teeth all present at death, only a few lost; abrasion not great, only a couple of molars cupped; yellow, dense; arch broad and deep; lower 3 m's very large and well developed, as large as the 2d m's; sup. 3 m's had two roots each; best mouth in the Ken- tucky group.



RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Kentucky M. B. 740	50	m	23 <sup>8</sup> , 3-32	17 <sup>8</sup> ,	23 <sup>4</sup>	17 <sup>8</sup>	None.	None.	Can't find any in the 11 teeth remaining.	Large deposits on the molars, rings on the others.	78	Teeth all present at death. up. 3 m's as large as the up. 2 m's; abraded beyond enamel junction, yellow; arch V-shaped and deep.
Kentucky M. B. 741	50	m	2 3-16	2 1-32	23 <sup>8</sup> , 1-32	17 <sup>8</sup> , 1-16	None.	The up. 1 & 2 m's gone on both sides in life	Of the teeth remaining in lower jaw there are 7 cavities in 10 teeth.	Large lingual deposits on lower teeth	78	Only the anterior teeth present at death; lost in preparation; none of the 3'd molars erupted, judging by the lower jaw; extensive abrasion; arch long and flat.
Kentucky M. B. 742	55	m	23 <sup>8</sup> , 1-16	2 3-32	23 <sup>4</sup>	2 1-16	None.	None.	Three crown cavities in molars.	Large gingival rings on the teeth		Teeth all present at death except the lower 3'd m's, which were never erupted; teeth small; molars cupped; anterior 1/4 their length; arch very deep; sup. 3 m's fully as large as the second molars.
Kentucky M. B. 743	50	m	21 <sup>4</sup> , 1-16	13 <sup>4</sup> , 1-16	25 <sup>8</sup> , 1-16	13 <sup>4</sup> , 1-16	None.	None.	None.	Evidence of large rings on all the teeth.		Teeth small, yellow, dense; arch very broad but not deep; lower 3 m's too as large as the second; molars cupped and all the teeth abraded beyond enamel junction; all the teeth present at death; a few ant. lost.
Kentucky M. B. 746	45	m	21 <sup>4</sup> , 1-16	2 3-32	miss ing.	miss ing.	None.	None.	None.	Traces of rings on all the teeth.	too bkn	Teeth small, dense, yellow; not much abrasion; all present at death. Judging from the sockets the 3 m's must have been as large as the 2 m's; arch broad and deep.
Kentucky M. B. 733	55	m	23 <sup>8</sup> , 1-16	2	miss ing.	miss ing.	None.	None.	Large p. p. s. r. 2 m.	Evidence of large deposits on molars.	80	Teeth all present at time of death; molars very large except 3d, which are small; the teeth square, dense, yellow, arch broad and deep.
Kentucky M. B. 732	40	m	21 <sup>4</sup> , 1-16	2 3-32	23 <sup>8</sup> , 1-16	13 <sup>4</sup> , 1-16	None.	None.	ap. s. r. 1 m	Traces of rings.	81	Teeth all present at death except lower 3d m's, which did not erupt; teeth small, square, very white (probably bleached); some of the molars cupped; arch deep and flat at vault.

Kentucky M. B. 730	20	m	op. 2 m. 242, 1-16	178	This great width due to 3 m's not erupted but present	2 1-16	Both 1. 2d bl. anterior borders point inward and forward	None.	None.	None.	82	Teeth all present at death; only 3 molars left, all very large; both lower 1 m's five cusps, each; all four 3 m's imbedded; when fully developed the jaws would be very large; no abrasion.
Kentucky M. B. 729	75	m	214, 1-16 op. 1 m. 258, 1-16	178, 1-16 Alveol. r point broken away.	miss ing.	x	x	Large p. p. s. 1. 2 m.	Evidence of large deposits.	79	Contraction at sup.; right heel; only two molars left, showing good structure; yellow; extensive abrasion; arch very broad and deep; left 3 m. small.	
Kentucky M. B. 748	55	m	288, 1-16	178,	miss ing.	None.	s. r. 1 bl. s. 1. 2 m. s. 1. 1. & cent inc. gone in life, probably abscess.	None.	Evidence of large deposits on the m's & rings on all	too bkn	Teeth nearly all present at time of death; 3 m's small; molars and bicusps worn off 1/3 their length; very large, cleft, palate (1) horse-shoe shaped, the curve 1/4 of an inch posterior to the central incisor, the heels of the cleft passing just in front of the post. palate foramen.	
Kentucky M. B. 728	20	f	op. 2 m. 288	2	234, 1-32	178, 3-32	None.	None.	None.	78	Young specimen; teeth all present but one central incisor; very large, well developed; 3d m's well developed; prognathism very marked; no abrasion; lower 3 m's imbedded.	
Kentucky M. B. 727	60	f	288	134, 1-16 Measure taken a little above the alveolar point.	234	158, 1-16	sup 1. 2 bl. & 1 m. ps'd inwards. l. r. 3 m's pitched forward and 2 m's gone in life	Large p. p. l. r. 1 m. p. p. l. r. 1 bl. ap. l. r. 2 bl. but both very slight.	Rings around the teeth, large but buc. deposits on sup. molars.	71	The roots of both sup. cusps remain, looking as if crowns were decayed off; lower teeth square and abraded 1/2 their length; upper not so much so; arch flat; an upper left bicuspid has been replaced in the wrong socket and throws out the articulation.	
Kentucky M. B. 724	60	m	178, 1-16	112, 1-16	234, 1-16	112, 1-16	None.	Large buc. cavity l. 1. 3 m. l. r. 2 m.	Large rings on the low r teeth.	81	Only the anterior roots left at death; above worn to gum; great contraction at heel of sup. arch; lower teeth also extensively abraded; l. 1. 3 m. two large well developed roots; crown large and square. The teeth remaining do not show the denture to have been large.	

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	FA.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Kentucky M. B. 723	45	f	1 3/4 op. 2m's 2 3/8	1 7/8	2 5/8, 1-16	1 7/8, 3-32	Lower left 3 m pitched forward.	Either the sup. 3 m's did not erupt or there has been absce- s with contraction & molars decayed.	Extensive buc. lingual & proximal cavities in all the up'r bis. and molars; the lower bis. contracted.	Lingual deposits on lower incis- ors.	73	Teeth of very poor structure, stain- ed brown, small, abraded about 1/3 their length. The most extensive in- stance of caries I have found in any specimen yet examined; arch deep. In 23 teeth and roots remaining there are 22 cavities.
Kentucky M. B. from a Mound In Union Co. 242	50	m	2 3/8, 1-16	2 1/8	miss ing.	miss ing.	None.	None.	Large ap In s. r. 1 m.	Buccal & lingual rings on the molars.	78	Teeth large, good structure, yellow; the first molars abraded beyond the enamel junction; arch very deep and rough; 3 m's triangular, but large, with well developed cusps.
Kentucky M. B. from a Mound In Union Co. 257	70	m	2 1/4	1 7/8, 1-16	miss ing.	miss ing.	s. r. cuspid never de- scend'd into line; the left cusps & cus- pids also of one proba- bly so.	Of all the right m's I 1 m. lat in- line; the left cusps & cus- pids also of right side.	Can't say; no teeth remaining to deter- mine.	Can't determine.	69	Only one molar left; all ant. and bi- cusps and 2 molars present at death; the one left shows extensive abrasion; arch broad and flat.
Louisiana M. B. from a Mound opp. Vicksburg. 426	45	m	2 3/8, 1-32	2 3-16	miss ing.	miss ing.	None.	None.	None.	Heavy gin- gival rings.	too bkn	Teeth all present at time of death; molars not large; bis. somewhat large in proportion; dense, exposed dentine, blackened; abraded from 1/4 to 1/3 their length; arch regular, narrow but deep.
Louisiana M. B. from a Mound opp. Vicksburg. 456	45	m	2 3/8, 1-32	2 1/8	miss ing.	miss ing.	None.	None.	None.	Slight traces.	too bkn	Teeth large, square, dense, yellow; all present at death, except 3 m's which did not erupt; arch regular; vault flat, medium depth; abrasion slight, not as much as age indicated.
Mississippi M. B. near Vicksburg. 656	55	m	2 1/2 3-32	2 1/8, 1-32	2 5/8, 2 3-16	2 3-16	None.	None.	Too small buccal cavi- ties in l. 1. 2 & 3 m's.	Light gingi- val rings.	71	Teeth all present at death; some lost in preparation; beautiful white teeth; beautiful and regular arch; molars all large except up. 3 m's, which are sm'; lower 3d m's as large as 2d m's, and each has five cusps, the fifth being at the back; abrasion not as extensive as the age; would indicate.



Mississippi M. B. near Vicksburg. 660	40	m	2 $\frac{3}{8}$	2	3	2 3-16	None.	None.	Large buc. rings on sup. m's; light gingi- val rings on all teeth.	77	Arch very large and deep; teeth me- dium sized; 2d and 3d m's above tri- cuspidar; upper teeth much more abra- ded than lower, though not unusual; teeth bluish white, and of very good structure.
Mississippi M. B. from a Mound near Vicksburg. 471	55	m	Too broken for mea- surement	miss ing.	miss ing.	None.	At the sup. bls.	Extensive caries of all four sup. bls. decayed to process.	Heavy gingi- val rings s- bkn	too	Arch small, teeth large and square; extensively abraded; heels broken away.
Mississippi M. B. near Vicksburg. 475	55	f	2 $\frac{1}{2}$ , 1-16	13 $\frac{1}{4}$ , 3-32	miss ing.	None.	None.	pp. s. r. 1 bl.	Heavy de- posits on buc sur m's	too	Arch broad, horse-shoe shaped; not deep; teeth all present at death; in- clisors and one cuspid lost in prepara- tion; good structure; all abraded about $\frac{1}{2}$ their length.
Mississippi M. B. 474	60	m	Too broken for mea- surement	2 $\frac{3}{8}$	2	None.	Extensive necrosis s. l. 2 and 3 m's and 1. r. 2, 3 m's s. r. 2 m.	Cannot de- termine.	Evidence of large depos- its on lower teeth especially.	74	Extensive abrasion, so as to cause abscess in five of the m's; in some in- stances the pulp chamber is open fr'm it; arch broad and jagged; sup. r. 3 m. did not erupt, neither did the lower left, the teeth very large and of good structure.
Mississippi M. B. from near Vicksburg. 472	60	m	2 $\frac{3}{8}$	1 $\frac{7}{8}$ , 3-32	miss ing.	None.	s. r. 3 m.	Large ap- proximal cavities in several m's and bls 1, 3 m. crown all hollow by decay.	Black gingi- val rings.	too	Arch somewhat V-shaped; narrow and deep m's, extensively and deeply cupped; other teeth abraded rather more than $\frac{1}{2}$ their length; grinding surfaces stained black; teeth evident- ly of good quality.
Mississippi M. B. from near Vicksburg. 415	55	m	2 $\frac{1}{4}$ , 1-16	1 $\frac{7}{8}$	miss ing.	None.	No evidence	Large cro'n and ap of s. 1, 2 m. & ap. in s. r. 1 and 2 m.	Traces merely.	73	Teeth small; all present at death; 5 molars and 1 bl. left; teeth white & extremely abraded; arch broad & flat.
Mississippi M. B. near Vicksburg. 404	65	m	Too broken for mea- surement	miss ing.	miss ing.	None.	Extensive necrosis of several mo- lars & bls.	Several m's & bl. decay- ed away to gingivae.	Large de- posits on m's buc. surface.	too	Arch jagged; teeth apparently good; second molars very large and exten- sively abraded.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Mississippian M. B. near Vicksburg. 405.	60	m	2½	178, 3-32	Miss ing.		None.	None.	None.	Gingival rings.	73	Arch broad and deep, flat at vault. Teeth splendid, in comparison with others of this series, and good any- how. Abraded from 1/3 to 1/2 of their length. Teeth small judging from sockets. 3 m's relatively large.
Mississippian M. B., near Vicksburg. 647.	40	m	2¾	2 3-32	2¾, 1-16	2 1-16	None.	Sup. right 1st m.	Large pp. s. r. 1 m.	Very large deposits on molars above and large gin- gival rings on all teeth.	73	Arch very large and broad and flat at vault. Molars all cupped, other teeth abraded from 1/3 to 1/4 their length. 3 m's above and below fully as large as the others, molars the largest I have seen in any skull of all I have examined and just as square as other molars.
Mississippian M. B., near Vicksburg. 476.	55	m	2¾	2	Miss ing.		None.	None.	None.	Gingival rings on all the teeth.	75	Teeth small and 3 m's fully as large as the 2 m's. Arch V shaped some- what. All teeth present but one in- cisor. Abrasion not as extensive as age would indicate.
Mississippian M. B., near Vicksburg. 480.	30 ?	m	2½, 1-16	2	2¾	178	None.	Lower cent. incisors lost in life. Socket ab- sorbed and shortened a. p. meas- ure some- what.	None.	Mere traces	Too broken.	Teeth medium sized, 2 and 3 m's much smaller than 1 m's. Abrasion very slight. Sup. 3 m's just erupting and slightly to the buccal side of the line of the dental arch. Arch V shaped and not deep, teeth very good. Lower right 3 m's did not erupt.
Mississippian M. B., near Vicksburg. 645.	70	m	2½	2	Miss ing.		None.	Sup. r. 1 m.	Sup. l. 1 m.	Evidence of large de- posits.	80	Arch horse-shoe shaped, not deep. Teeth very extensively abraded to gum line. Teeth large, all present at death but one.
Mississippian M. B., near Vicksburg. 663.	65	m	2¼, 1-32	2 1-32	Miss ing.		None.	S. l. 3 m.	Can't say, no teeth remaining.	Can't say.	80	All teeth present at death but one, only one tooth remains, a bicuspids extensively abraded; black stain on crown surface of dentine. Arch shallow.

Mississippi M. B., near Vicksburg. 661.	45	m	2 1/2, 1-16	2 1/8	27 3/8	17 3/8, 1-16	None.	None.	None.	Heavy gingival rings around all the teeth.	72	Teeth all present at death, nearly all the uppers gone, lowers nearly all present, medium sized, yellow, dense. M's abraded 1/2 their length. Arch broad and shallow, horse-shoe-shaped, 1. 3 m's as large as 2 m. Sup. 3 m's small.
Mississippi M. B., near Vicksburg. 648.	45	m	Too broken in front to measure.	2 1/2, 1 1/32	2	None.	None.	None.	Large buccal deposits on up. m's. Gingival rings on lower teeth.	81	Teeth all present at death, square, yellow, dense. Lower m's all largely cupped, uppers not so much, other teeth abraded beyond enamel junction. Lower 3 m's not quite so large as 2 m's, upper 3 m's small. Arch deep.	
Mississippi M. B., near Vicksburg. 653.	70	m	2 1/8	13 1/4, 1-16	25 3/8, 1-16	17 3/8	None.	All teeth back of bis. above gone in life. Great absorption of ridge 5 abs. above, 2 below.	Heavy gingival rings, especially below.	70	Teeth all present below except 3 m's which did not erupt. Above teeth all present anterior to the m's. Teeth ground off clear to gum line, many pulp chambers exposed in consequence. Arch broad and normally deep.	
Mississippi M. B., near Vicksburg. 655.	60	m	2 1-16 op. 2 m's 23 3/8, 1-16	2	The inferior maxillary of this specimen does not belong to it.	None.	None.	R. 2 m. r. cuspid 1.1.	Enormous incrustations on molars.	80	Teeth all present at death except 3 m's which did not erupt. Extensive abrasion of the four molars, the other teeth correspondingly, presumably though lost in preparation. The molars only remaining.	
Missouri M. B., exhumed from a mound in St. Louis Co., about 12 miles from St. Louis. 2099.	45 to 50 ?	m ?	2 1/4, 1-16 op. 2 m's 2 1/2, 1-16	2	Missing.	None.	None.	Buccal cavity in both 3 m's.	Evidence of gingival rings.	77	Teeth all present at death, ten remain, roots blackened. Teeth large. Abrasion anterior to the 2 m's beyond the enamel junction. 3 m's flattened ant. posteriorly. Arch rounded, regular, broad but not deep, flat at vault.	
Ohio M. B. 2196.	30 ? f ?		23 3/8	Ant. post. gone.	Missing.	The portions left show regular alveoli.	x	None in teeth remaining.	Rings on the molars.	Too broken to determine.	But 4 teeth remaining, viz.: The 2 first and 2 second molars. Small; abrasion slight. Sockets for third molars very small. Arch deep.	



RACE.	AGE.	SEX.	UPPER JAW. LATER- AL. ANTI- POST.	LOWER JAW. LATER- AL. ANTI- POST.	IRREG.	ABSCESS.	CARIES.	CAL.	FA.	REMARKS.
Ohio M. B., Madisonville, Ohio. 2655.	50 ? m	?	2 <sup>1</sup> / <sub>8</sub> op. 1 m 2 <sup>1</sup> / <sub>4</sub> , 1-16	2 <sup>1</sup> / <sub>2</sub> , 3-32	1 <sup>7</sup> / <sub>8</sub>	None.	None.	Large deposits on nearly all the teeth.	70	Molars very large, extensively abraded, stained brown, no evidence of sup. 3 m's having erupted. Arch long and flat. Lower 3 m's very large and well developed, as large as second molars on same side.
Ohio M. B., Butler Co., O. 2657.	50 ? m	?	2 <sup>3</sup> / <sub>8</sub> , 1-16	Miss ling.	None.	None.	None.	None.	80	Teeth all present at death, anterior gone in preparation. Very extensive abrasion. Teeth dense and yellow. Arch very broad and deep, 3 m's well developed and larger than the average.
Ohio M. B. 2656 Madisonville, Ohio.	50 ? m	?	2 <sup>1</sup> / <sub>2</sub> , 3-32	2 <sup>3</sup> / <sub>4</sub>	None.	sl. 1 m.	2 prox on crown & 2 bucc cavities in lr. m's.	Evidence of large deposits.	72	Nearly all teeth present at death. Teeth very large, bluish; pretty well abraded; cupping not extensive. Palate deep and arch V-shaped interlony; sup. 3 m's small, lower large.
Ohio M. B. 2043 from Madisonville, Ohio.	35	f	2 3-16	miss ling.	None.	None.	No evidence judging from the 6 teeth remaining.	Large deposits on the molars.	Too broken to make.	Anterior portion of arch gone. The teeth remaining are small; one molar slightly cupped; the 3d molars very small; the left one is round and only 3-16 in. diameter.
Ohio M. B. 2045 Madisonville, Ohio. Age put at 50; abrasion does not show more than 40.	40 ?	m	2 <sup>1</sup> / <sub>2</sub> , 1-16	2 miss ling.	None.	None.	None.	Large deposits on incisors & bicuspids.	Too broken to make.	Teeth all present at death; molars large and square; 3 m. very wide; laterally compressed ant. post.; they have but one large conical root each; abrasion each; abrasion not extensive; arch very broad and deep.
Ohio M. B. 2042 Madisonville, Ohio.	25	m	2 <sup>1</sup> / <sub>2</sub>	miss ling.	None.	None.	None.	Traces of rings.	79	Teeth all present at death; but six remain; molars square; abrasion slight; 3 m's had two roots each; arch broad and flat.
Tennessee M. B. from a mound near Nashville. 1874	60	m	2 <sup>1</sup> / <sub>4</sub> , 1-16	2 <sup>5</sup> / <sub>8</sub> , 3-32	Only three fr. inc. they twisted; 1.3 m's point inward.	None.	Very large crown cavities l.r. 2 m.	Evidence of large deposits.	Too broken.	Teeth all present at death; a good many lost; not large; abrasion of the molars not so extensive as age would indicate; arch broad but flat; lower 3 m's very large, with well developed cusps; sup. 3 m's small.

Tennessee M. B. from Walnut M'nd, near Nashville. 1875	55	m	214; 1-16	2	21/2; 3-32	15/16; 1-16	Upper and l.r. inc. twisted, lapped and very crowd- ed, l. r. 3 m. packed for- ward and inward.	All molars below gone in life; save cav. in sup. the l. r. 3 m.	Both sup. 2 m's exten- sively de- cayed; cr. n cav. in sup. l. 3 m.	Large rings around the teeth.	Too broken.	All upper teeth present at death and all lower anterior to the first m's; abra- sion not to amount to much as the age would indicate; lower right 3 m's very large, with well developed cusps; arch regular and not deeper than ordinary.
Tennessee M. B. near Nashville. 288	50	m	25/8	17/8; 1-16	25/8; 3-32	17/8; 1-16	None.	None.	Two buc. cavities in l. r. 2 and 3 m's each one.	Traces of large de- posits on bls. & m's.	78	Teeth all present at death; small; abrasion slight; lower 3 m's about as large as the second m's; upper small; the up. right 3 m. had four roots; arch very broad, not deep; flat at the vault.
Tennessee M. B. 458	45	m	21/2	21/8	23/8; 1-16	2 1-32	Lower incisors crowded.	None.	None.	Evidence of large de- posits on m's & rings on all.	Too broken.	Teeth all present in specimen except one; very large and abraded from 1/3 to 1/2 their length, especially the mo- lars; cupped surfaces stained black; large dense teeth. 1. 3 m's apparently larger than 2 m's; up. r. 3 m. very large; left one elongated laterally; arch very deep; s. r. 3 m. four roots.
Tennessee M. B. 1467	55	m	23/8; on 1 m. 21/2; 1-16	21/8	25/8	2	None.	None.	None.	Evidence of large de- posits on m's	73	Teeth all present at time of death; molars large, square and all cupped; the 3 m's lost in prep.; the lower ones had two roots each; arch deep and ragged; the upper left 3 m. had three roots, the right one two roots.
Tennessee M. B. 1471	50	m	25/8; 3-32	2	27/8	2	The lower cent. inc. standing almost ant- posterior.	None.	None.	Rings on all the teeth.	Too broken.	Teeth all present at death; very small; the lower third m's as large as the second; the upper small; the left one 3 roots, the right two; arch very broad and deep; the teeth all abraded; some of m's cupped.
Tennessee M. B. near Nashville. 1879	25	f	2 3-16	17/8	23/8; 1-16	13/16; 1-16	Sup r. 2 bl. impacted against the first m.; l. 3 m's pitched inwards.	s. l. 1 and 2 m.	Crown cavi- ties in the molars.	Slight traces.	73	Teeth small; all present at death but a couple of abscessed m's; abra- sion very slight; the upper 3 m's bear a good proportion to the second m's above; the lower are very large, with four well developed cusps.

RACE.	AGE	SEX	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	F.A.	REMARKS.
			LATER- AL.	ANTI- POST.	LATER- AL.	ANTI- POST.						
Tennessee M. B. near Nashville. 1885	35	m	2 1/4 1-16	2 1-32	2 5/8	2 1-16	None.	None.	Crown cavities in I. r. 3 m. bug in I. 2 & 3 m.	Heavy lingual rings on lower teeth.	Too broken.	Teeth all present at death; lower molars large; the three m's nearly as large as the 2 m's; sockets for sup 3 m's small; arch broad and deep; abrasion not amount to much.
Tennessee M. B. near Nashville. 1886	60	m	2 2/8	2	Right ramps gone; can't measure.		None.	Sup 1. 2 and 3 m's and right 3 m. I. 1. 2 bl. & 1 m.	Extensive pp. s. 1. 1 m. pp. s. r. 2 m.	Rings at gingiva.	Too broken.	Nearly all present at death; but few lost; upper abraded 1/2 their length, lower 1/3; arch deep and regular; lower left 3 m not erupted.
Tennessee M. B. 1891	60	m	2 3-32	1 3/4, 1-16	2 3/8, 1-16 1 3/4, 1-16		None.	None.	Small crown cav. S. 1. 3 m.	Gingival rings around all the teeth.	Too broken.	Teeth all present at death; small, good structure, abraded about 1/2 their length. Lower left 3 m. never erupted. Arch regular and deep. About one-half of the teeth lost in preparation.
Tennessee M. B. 1891	Probably not over 60	m	2 1-16	1 7/8	2 1/2, 1-16	1 7/8	None.	S. 1. 1 bl.	S. 1. cuspid, I. 1. 1 bl. Lower left cusps decayed off to gum.	Rings on the remaining teeth.	74	All molars above and below lost during life. Great contraction of up. and lower heels. Arch flat. The remaining teeth show extensive abrasion. Arch was deep before loss of teeth. Nearly all the roots exfoliated.
Tennessee M. B. 1872	60	m	2 1/4, 1-16	1 3/4, 1-16	2 5/8, 1-16	1 3/4	None.	S. r. 1 bl. S. 1. 1 bl.	L. 1. 1 m. crown decayed off to gum.	Evidence of large deposits on all the teeth.	70	Nearly all upper teeth present at death. All the lower m's except left 1 m. gone in life. Abrasion very extensive. S. r. 3 m. never erupted. Arch regular, not large nor broad, but deep. Can't say whether lower 3 m's were erupted or not.
Tennessee M. B., from near Nashville. 1869	30	m	2 1/4, 1-16	1 7/8, 3-32	2 3/8, 1-16	2	None.	None.	None.	Very large deposits all around the teeth.	Too broken.	All teeth present at death. A few anterior teeth lost in prep. Arch regular and deep. 1 and 2 m's large and square; 3 m's small above and below. Upper molars slightly cupped. Sup. right 2 bl. has septa for 3 roots—two buccal and 1 palatal.
Tennessee M. B., near Nashville. 1872	40	m	2 3/8, 1-32	2 1-16	Miss ing.		S. r. 1 bl. stands anteriorly, dist. surf. out.	S. 1. 1 m.	Large crown cav. in s. 1. 1 m. Exposure cause of abs.	Rings on all the teeth.	75	Teeth all present at death. Arch broad and deep. 3 m's fully as large as the second m's. Several of the molars cupped, otherwise the abrasion is not extensive. Left 3 m. has four roots, the right has three.



Tennessee M. B., near Nashville, 1878	30	f	23 $\frac{3}{8}$ , 1-32	2	1-16	Miss ing.	None.	None.	None.	Slight rings around nearly all the teeth.	Too broken.	Teeth all present at death. About half gone. No abrasion. Teeth average size. Cusps well developed. Arch broad and deep; flat at vault—regular. Judging from the sockets, the 3 m's were of good size in proportion.
Tennessee M. B., near Nashville, 1873	40	m	21 $\frac{1}{4}$ , 1-16	17 $\frac{3}{8}$ , 1-16	23 $\frac{3}{8}$ ; 1-16	13 $\frac{3}{4}$	None.	None.	None.	Gingival rings around all the teeth.	77	Teeth all present at death. First m's large, square. Other teeth small. The sup. right 3 m. and the lower right 3 m. never erupted. The lower left 3 m. fully as large as 2 m. All more or less abraded. Lower molars and bicusps cupped. Arch broad, deep, with palatine ridge.
Tennessee M. B., near Nashville, 1868	55	m	21 $\frac{1}{2}$ , 1-16	2	3-32	25 $\frac{3}{8}$	2	L. r. cuspid twisted.	L. 1. 1 m., l. r. 1 and 2 m gone in life	Large buc. deposits on sup m's. Rings on all teeth.	Too broken.	Nearly all present at death. Only a few missing in specimen. Sup. m's very large. The sockets of sup. 3 m's indicate small 3 m's. Arch very broad and deep. Lower left 3 m. not erupted. Sup. m's on left side extensively abraded; other teeth not much.
Tennessee M. B., near Nashville, 1866	50	f	21 $\frac{3}{8}$	17 $\frac{3}{8}$ , 1-16	21 $\frac{1}{2}$	13 $\frac{3}{4}$ , 1-16	None.	S. 1. 1 and 3 m. Three same side molars be- decayed off to gum. Two prox. cav. in lower jaw.	Crown cav. s. r. 1 m. Both bl's on same side	Rings around all the teeth.	70	Teeth nearly all present at death. Small and all more or less abraded, but not extensively. Arch regular, not deep; flat at vault. All 3 m's small.
Tennessee M. B., near Nashville, 1867	45	f	21 $\frac{1}{4}$ , 1-16	17 $\frac{3}{8}$ , 1-16	21 $\frac{1}{2}$ , 1-16	17 $\frac{3}{8}$ , 1-16	None.	None.	None.	Large deposits on lower central teeth—buc and lateral. Rings on all.	Too broken.	Teeth all present at death. Molars cupped. Teeth medium size; lower third m's pretty well developed. Upper third m's very small. Arch regular and deep.
Tennessee M. B., near Nashville, 1864	50	m	23 $\frac{3}{8}$	17 $\frac{3}{8}$	25 $\frac{3}{8}$	17 $\frac{3}{8}$	None.	L. 1. 2 m., l. r. 1 and 2 m. Gone in life, l. 1. 1 bl	Ap. s. r. 2 bl. Ap. l. 1. 3 m.; and crown ap. in both lower 1 bl's.	Large deposits on surface lower incisors. Rings on all.	75	Teeth all present at death but four. Small. Lower 3 m's very large. Abrasion of lower teeth very extensive—especially anterior 10 teeth. Anterior upper also more abraded than the molars. S. 1. 3 m. did not erupt. Arch not deep but broad.

RACE.	AGE.	SEX.	UPPER JAW.		LOWER JAW.		IRREG.	ABSCESS.	CARIES.	CAL.	FA.	REMARKS.
			LATER-AL.	ANTI-POST.	LATER-AL.	ANTI-POST.						
Tennessee M. B., 1865	55	m	2½	2	Missing.		None.	S. 1, 2 and 3 m's, and both first bis.	Both 1 bis.	Evidence of large deposits.	74	Molars very large and square. 3 m's small. A few teeth—m's and bis—cupped; otherwise the abrasion is not much. Arch narrow and deep.
Tennessee M. B., near Nashville. 1862	55	f	2 1-16	2 1-16	2½, 1-16	1¾	S. r. 1 bl. stands ant. post. buc. surf. forward.	L. r. 1 m., l. 1, 3 m.	None.	Large deposits covering the whole surface of lower m's; Rings on all	77	Teeth nearly all present at death. Abrasion not as much as age would indicate. Arch regular and deep. Neither of the sup. m's erupted. Lower 3 m's small.
Tennessee M. B., near Nashville. 1863	22	f	2¾	2 1-16	Missing.		None.	None.	Two large crown cavities in sup. l. 1 m.	Large deposits on buc. surf. of m's.	75	Teeth all present at death. 1 m's large; other teeth average. Size 3 m's small, judging from sockets. No abrasion. Arch regular.
Tennessee M. B., near Nashville. 1861	23	f	2¼, 1-32	2	2½, 1-32	2	Lower 3 m's turned outward.	None.	None.	Traces.	75	Teeth all present at death. Yellowish-white; small, with well-developed cusps. L. 3 m's large in proportion. Arch regular, narrow and deep. Mere traces of abrasion.
Tennessee M. B. 1468.	65	f	2¼, 1-16	2¼	2½	1¾	L. l. lat. Incisors stood ant. post.	L. 1, 3 m., l. r. 2 m.	None.	Rings on all teeth present in specimen.	71	Upper teeth present at death; lower, anterior only; abrasion extensive, teeth small, l. r. 3 m. did not erupt; sockets for sup. 3 m's indicate good-sized 3 m's; arch broad and deep, regular; back of bicuspids the lower jaw is shrunken.
Tennessee M. B., near Nashville. 2628.	45 ? m ?		2½, 1-32	2 1-16	Missing.		S. l. 1 bl. twisted, all bis. pressed inward.	None.	None.	Evidence of large deposits on the m's.	71	Teeth all present at death; teeth small, 3 m's very small; molars ground off to enamel junction and beyond it in 1 m's. Arch very deep, broad and line of teeth saddle-shaped. Hypertrophy of alveolar ridges back of bicuspids.
Tennessee M. B., near Nashville. 2629.	40 ? m ?		2 1-16	1¾	Missing.		x	x	x	x	77	Arch small, age doubtful, teeth and sutures contradictory; 3 m's did not erupt.
Tennessee M. B., near Nashville. 2630.	35 ? f ?		2 3-16	1¾, 1-32	Missing.		None.	None.	S. r. 3 m. crown decayed off.	Slight rings on m's.	76	Teeth all present at death; yellow, abrasion slight, arch narrow and deep; teeth not average size; 3 m's small.

Tennessee M. B., 2627.	45 ? m ?	25 $\frac{1}{8}$	2 3-32	Mis sing.	None.	1 l. m.	None.	Traces of deposits.	73	Teeth all present at death, only six remain; bleuspids cupped, teeth small, arch broad and deep and ragged. The one 3 m. remaining bears a fair proportion in size compared with 2 molars. Very irregular teeth; scattered; molars very large and not abraded, anterior teeth worn down to gum line on palatine surface; 3 m's did not erupt. Large exostosis of molar roots; alveolar ridge greatly exostosed.
Tennessee M. B., near Nashville, 2626.	65 ? m ?	2 $\frac{1}{2}$ op. 2 m's. 27 $\frac{1}{8}$ , 1-16	2 $\frac{1}{4}$ , 1-16	Mis sing.	Teeth all more or less irregular and scattered.	None.	Extensive ap. s. l. 1 m.	Large deposits on molars.	74	
Tennessee M. B., near Nashville, 2625.	45 ? f ?	2 $\frac{1}{4}$	1 $\frac{7}{8}$ , 1-16	Mis sing.	Anterior teeth slightly crowded.	None.	Crown cavity r. 1 m.	Large deposits on buc. surf.	81	Teeth all present at death, six remain; 1 m's partially cupped, other teeth worn off to enamel junction; arch narrow and deep; teeth yellow and not large.
Tennessee M. B., near Nashville, 2624.	65 ? m ?	23 $\frac{1}{8}$	1 $\frac{7}{8}$ , 1-16	Mis sing.	None.	All four of the 2 and 3 molars.	L. 1 m.	No teeth left to determine.	74	All teeth present at death except the 2 and 3 m's, both sides; arch regular; the remaining roots show extensive abrasion; arch narrow, not deep.
Tennessee M. B., near Nashville, 1860.	20 m	23 $\frac{1}{8}$ , 1-16	1 $\frac{7}{8}$ , 1-16	23 $\frac{1}{4}$ 1 $\frac{7}{8}$ , 1-16	Lower incisors slightly twisted.	None.	Two crown pits in upper 2d m's.	Slight rings on molars.	Too broken.	Teeth all present at death except the sup. 3 m's, which did not erupt; teeth large and yellow; abrasion indicates an age of about 35 years, arch regular, narrow and deep; lower 3 m's two roots each.
Utah M. B., from the outer edge of mound one foot below the surface, at Provo. 965.	40 f	2 $\frac{1}{4}$ , 1-32	1 $\frac{5}{8}$ , 1-16	Mis sing.	None.	Both sup. l. bls. gone in life, probably by abscess.	None.	Large buc. deposits on molars.	79	3 m's never erupted; teeth all present at death except 1. bleuspids; anterior teeth extensively abraded; white; molars somewhat small and flat; arch very deep and flat at vault.
Wisconsin M. B., from Racine, 271.	45 m	2 $\frac{1}{2}$ , 1-16 op. 2 m. 25 $\frac{1}{8}$	2	23 $\frac{1}{4}$ , 1-16 2 1-16	One or two of the lower incisors slightly twisted.	L. l. 3 m. 2 l. bic. pressed toward the tongue.	Buc. cav. sup. right 3 molar, l. 1. 3 m. crown all hollow.	Traces of rings around the teeth.	73	Teeth all present at death; molars square, lower third molars large and well developed; sup 2 m's compressed out posteriorly. Arch deep and rough, molars somewhat cupped; anterior and bl. abraded to enamel junction.



# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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## COLLEGE TEACHING.

The fact is almost universally admitted in the profession to-day that our colleges form the most important factor in dental education, and it becomes us to study present methods of college teaching.

Often has it been said, and truly: "It is one thing to know a fact, and another thing to impart that knowledge intelligibly to others." In no department of education do we find this emphasized to a greater degree than in teaching dental students. Our professors, while mostly men above the average in learning, do not always succeed to the best advantage in imparting their knowledge to students. They do not realize that the student comes to them in many instances without the slightest knowledge of the theories to be taught. They oftentimes launch out into the middle of the subject without a proper elucidation of the first principles, leaving the student floundering in confusion from lack of comprehension.

First principles are as necessary to a dental student for his understanding of subjects taught in college as are the A B C's to a child who is subsequently expected to understand the formation of words. The professor seldom stops to measure the difference between himself and the ordinary class of junior students, and often discusses before them the merits of this and that theory in language too complicated, and with the same vague generalities that are employed in dental societies.

A profound consideration of every theory is perfectly proper before the student is finally graduated, but too much profundity

should not be indulged in till his mind is so formed that he can grasp and retain that which is taught.

In the use of technical phrases no word should be employed without first giving the student its true meaning and significance, for while some of our matriculants come to us with a sufficient education to readily grasp technical terms, the large majority—more's the pity—are so notoriously deficient in this respect that an ordinary lecture, dipping deep into the phraseology of the profession, sounds like so much Greek to them.

It is often the case that a junior student spends the first half of the session in a confused endeavor to find out what the professor is driving at, and begins to see the light only when iteration and reiteration of the different terms associates in his mind a dim perception of their meaning. Much of the student's dilemma might be relieved if the professors were careful to explain all new phrases in the beginning. The lecturer should watch his class closely and determine, by frequent quizzing, whether or not he is being understood, and he should not pass any portion of the question till it is understood.

Then in the presentation of any subject systematic methods should be employed and the work classified as much as possible. Above all things the line of thought followed should be consecutive—step by step, from the basal principles of the subject up to its minutest details. Right here is where many of our lecturers fail. They do not carry the student with them because they make no attempt to develop their theories in logical sequence. Instead of beginning at A and going on in regular order to Z, they are liable to start in somewhere about W, and wind up in a confused assortment of dental diphthongs. To be more exact, the student should not be taught how to put in a filling before he is instructed in the proper preparation of a cavity; he should not be allowed to arrange a set of artificial teeth until he knows something about taking an impression.

And while in the lecture room the class should be kept constantly entertained; a vivid interest should be sustained throughout the lecture. Unless the whole attention of the class is commanded, much that may be said is lost. Any diversion should be checked at once and the class made to understand that, for the time, the subject in hand is supreme in importance to anything else. If a tendency to drowsiness begins to manifest itself among

the students, or the interest for any reason seems to lag, the lecturer should immediately change his tack in some way to rouse the class to renewed attention. An apt story to illustrate the point in question, or—what is usually productive of better results—a case in practice bearing on the subject, will often accomplish wonders in brightening up the class. Students are always eager to listen to incidents of office practice from their professors, and the latter should always be armed with an ample fund ready to be used when occasion seems to demand.

But this question of college teaching broadens out more and more as we write upon it, and a proper consideration of the subject would extend too long for an editorial.

One other point, however, may be mentioned briefly: In two departments—operative and prosthetic dentistry—the teaching should be as much as possible clinical. Lectures of course should be given, but every theory taught in the lecture-room should receive practical demonstration in the infirmary or laboratory. Watching the actual performance of the work will enlighten the average student more quickly and effectively than any amount of mere explanation. An impression on the mind is made in the clinic which cannot possibly be made in a lecture, and methods may be taught by demonstration which cannot well be made intelligible by talking.

More particularly is this true of prosthetic dentistry, and the fact that many of our graduates leave college without a due proficiency in this department, should stimulate our colleges to improved methods of instruction.

Dr. L. P. Haskell, in a recent article on this subject advocates a limitation of the period spent in the lecture-room, and aptly suggests that the professor should employ the larger part of his time in the laboratory with the class, demonstrating his methods as he lectures upon them. As it is now, demonstrators do not always carry out the theories taught by the lecturer, and often students are confused by what seems to them a conflict of opinion.

The important part which college teaching plays in dental education should impress our faculties with their responsibility in the matter, and should incite them to study well the best interests of the student, to the end that the men who are turned out in the future shall be better fitted to practice their profession than those who have been graduated in the past.



## SECOND INTERNATIONAL DENTAL CONGRESS, 1893.

The DENTAL REVIEW, since first proposing that a second independent congress be held at the time of the Columbian World's Exposition in 1893, has received such general encouragement and support from the dental profession, that although three years still intervene before the opening of the Congress, its success is already assured. We are thankful to all those who have expressed to us their wishes and promised the REVIEW their support for their kindly offers, and we promise them that they will find the REVIEW supporting any measure which promises to advance the profession and to make its members better professionally, socially, or any way which may improve and benefit them.

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## DENTAL COLLEGE COMMENCEMENTS.

When all of the colleges will have held their commencement exercises, we believe it will be noticed, that although the classes at nearly all of the dental colleges have increased the number of graduates, is proportionately less. We hope that this may be taken as an indication that the standards of the various colleges has been raised and that the men who now leave the colleges are better educated than any who have preceded them.

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## DR. BETTY'S PAPER.

In this issue of THE DENTAL REVIEW we present to its readers a lengthy article from the pen of Dr. Betty. This is the first instance in the history of dental journalism in the United States, that a scientific work of this character and magnitude has been presented to the subscriber. Not many will realize the amount of labor and care involved in the work as performed by Dr. Betty, or know of the enormous expense involved in the printing of such a mass of tabulated matter, and the task of proof-reading involved in such a work.

It is not probable that the paper and tables can be digested at once; they will require careful reading and study and frequent perusal. Few can fathom the scientific value of these examinations and the effect which this character of inquiry and study will have on the scientific status of the dental profession.

The only thing we regret in connection with the publication of this lengthy paper, is the fact that we are compelled to defer the

publication of many valuable, scientific and practical papers until succeeding issues of the REVIEW. It was thought best to publish the entire paper and tables in one issue, thus presenting our subscribers with a work which, if published in book form, would alone represent the entire year's subscription price.

As has often occurred, we are again compelled to increase the number of pages.

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#### ILLINOIS STATE DENTAL SOCIETY.

The forthcoming meeting of the Illinois State Dental Society at Springfield ought to be well attended by the dentists of Illinois and the neighboring States. The usual railroad and hotel reduction in rates has been secured. Springfield is certainly central, a good programme has been prepared, and now nothing remains but to be present, take part in the work of the society and make it one of the most successful meetings ever held.

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#### DOMESTIC CORRESPONDENCE.

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##### ROOT FILLING AGAIN.

*To the Editor of the Dental Review:*

DEAR SIR:—Knowing that for many years you have taken an unmistakable position in calling for, and maintaining a high standard in the operation of root filling, in pulpless teeth; and in view of the recent experiments you have been making in that direction, I take the liberty of calling your attention to a paper on root filling; in the *Dental Cosmos* of March, Vol. 31, page 169. You will notice that the writer states that he uses a creamy solution of gutta percha in chloroform, pumping the solution into the canal with a fine broach wound with a few shreds of cotton; he then wipes out and dries the pulp chamber, places a small piece of heated base-plate gutta-percha over the entrance to the root, and by very gentle pressure on this, forces the canal contents down. He says nothing about using gutta-percha cones with this solution, nor does he mention any other material with which to follow it up, and properly fill the root. Please observe in his third conclusion the writer says, "in case of subsequent trouble the tooth may, with much greater satisfaction, and directness, be treated from the outside

than through the root canals;" now what I wish to know, is this: would you consider a root, or the root canals, of a tooth well *filled*, if treated in the above stated manner? Is not such a method of procedure likely to bring gutta-percha into disrepute as a root filling?

Yours respectfully,

C. F. HARTT.

Chicago, Ill.

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## REVIEWS AND ABSTRACTS.

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DENTAL KALENDER FÜR DEUTSCHLAND, OESTERREICH, UNGARN UND DIE SCHWEIZ, 1890. III Jahrgang, Theil I und II, von Dr. Erich Richter, Breslau, Germany.

This dental calender published by Dr. Erich Richter, of Breslau, Germany, annually for the last three years, consists of two parts: part one being a cloth-covered appointment book, containing a page for each day of the year, blank pages for "special notices," "monthly receipts and expenditures" and "addresses."

The book also contains a table of dental signs, notes and other abbreviations for recording operations. A table of materia medica embracing the drugs generally used by dentists, and giving the maximum and minimum dose. Tables showing the number of drops of important liquids to the gramme, the metric system, English and American tables of weights and measures. Domestic measures, the conversion of the various thermometrical scales, tables showing the topographical body temperature, frequency of pulse and respiration, time of eruption of the temporary and permanent teeth, steam-pressure, dental antiseptics, expansion of steam at different temperatures, melting point of metals. Recipes for alloys of gold and silver, clasp-metal, tin, etc., etc.

Part two is paper-covered, consisting of 280 pages, having formulæ for tooth-pastes, tooth-powders and mouth-washes. A list of the books published in 1889 and a list of dental colleges of the world, and of the dental societies of Europe, and the principal societies in other parts of the world.

But the principal object of the book is to give a full list of the dentists practicing in the German Empire, Austro-Hungary, Switzerland, Denmark, Sweden, Norway, Belgium and the Netherlands. There is also a partial list of the dentists in Roumania, Russia, Bulgaria and Servia. The practitioners in each city are grouped as



"Zahnärzte," "Those who graduated in America," "Graduated in other foreign countries" "Zahnkünstler and Zahntechnicke."

The following statistics are given:

Germany,	engaged in the practice of dentistry,	-	2,764.
Austro-Hungary,	" " " "	- -	533
Switzerland,	" " " "	-	291
Norway,	" " " "	- -	76
Sweden,	" " " "	-	85
Denmark,	" " " "	- -	79
Finland,	" " " "	-	13
Belgium,	" " " "	- -	268
Holland,	" " " "	-	61
Roumania,	" " " "	- -	28
St. Petersburg,	" " " "	-	95

#### BOOKS RECEIVED.

REPORT OF THE COMMISSIONERS OF EDUCATION, FOR THE YEAR 1887-8.  
Washington: Government Printing Office, 1889. \*

#### PAMPHLETS RECEIVED.

VERHANDLUNGEN DER DEUTSCHEN ODONTOLOGISCHEN GESELLSCHAFT.  
Band 1 ; Heft 1 and 2. Berlin: 1890.

THE HISTORY OF FEDERAL AND STATE AID TO HIGHER EDUCATION IN  
THE UNITED STATES. Washington: Government Printing  
Office, 1890.

PROCEEDINGS OF THE DEPARTMENT OF SUPERINTENDENCE OF THE  
NATIONAL EDUCATIONAL ASSOCIATION, at its meeting in Wash-  
ington, March 6-8, 1889. *Ibid.*

### DENTAL COLLEGE COMMENCEMENTS.

#### MEHARRY SCHOOL OF DENTISTRY.

The fourth annual commencement exercises of the School of Dentistry of Meharry Medical Department of Central Tennessee College were held at Masonic Theater, Nashville, Tenn., February 27, 1890, in connection with the medical and pharmaceutical commencement of the same college. The (2) graduates were: D. G. Ferrill, of Texas, and S. J. Watkins, of Tennessee.

The address to the graduates was delivered by Rev. J. C. Hartzell, D. D., of Cincinnati. The Morrison Medal, given for excellence in mechanical and operative dentistry, was awarded to D. G. Ferrill.

## PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

The thirty-fourth annual commencement exercises of the Pennsylvania College of Dental Surgery were held at the Academy of Music, Philadelphia, Pa., on Friday Evening, February 28, 1890. After prayer, by the Rev. J. C. Thompson, M. D., the degrees were conferred by I. Minis Hayes, M. D., president of the Board of Trustees. The address to the graduates was delivered by Prof. J. Ewing Mears, A. M., M. D. The degree of Doctor of Dental Surgery was conferred on the following named (76) persons :

R. W. Allan, New York.	Geo. W. Kesel, Pennsylvania.
G. C. Anthony, Pennsylvania.	B. M. Knight, Virginia.
A. S. Atkinson, England.	J. Orr Kyle, Ireland.
Rupert G. Beale, Pennsylvania.	W. B. Lake, Pennsylvania.
Edw. V. Beardsley, New York.	A. A. Lay, New York.
J. S. Birdsong, Mississippi.	Edmund Lord, Pennsylvania.
R. W. Berthel, Pennsylvania.	C. H. Lorange, New Jersey.
R. T. Brown, Pennsylvania.	Carl Lorenz, Germany.
J. H. Burton, Delaware.	H. T. Martin, Pennsylvania.
A. H. Butterfield, New York.	J. W. Meisgeier, Pennsylvania.
R. C. Carr, Canada.	M. F. Miller, New York.
Perry R. Chance, Ohio.	Martha B. Moore, Pennsylvania.
Lydia C. Clare, New York.	J. W. A. Musgrove, Canada.
H. H. Colehower, Pennsylvania.	Geo. S. Nason, Nebraska.
E. S. Cornell, New York.	Margaret Neilson, New Jersey.
Chas. O. Dager, Pennsylvania.	Porter S. Oakley, New York.
S. S. Davis, Pennsylvania.	W. E. C. Orr, Pennsylvania.
I. H. Deacon, D. D. S., Pennsylvania.	D. W. Peterson, Canada.
Guillermo Esguerra, U. S. Columbia.	G. H. Phelps, Mass.
Geo. A. Ewell, Massachusetts.	T. A. Powell, Pennsylvania.
F. W. Farmer, New York.	G. H. Rabenold, Pennsylvania.
Archie G. Fee, Minnesota.	R. L. Ramsey, North Carolina.
Felix Fischler, Germany.	J. D. Ribeiro, M. D., Brazil.
Benj. Frontz, Pennsylvania.	E. V. Rice, Minnesota.
T. P. Gardner, Kentucky.	Benj. F. Rose, Pennsylvania.
M. H. Glocker, Pennsylvania.	W. D. Scholl, Pennsylvania.
C. F. Gorham, Canada.	E. V. Sheerar, New York.
B. C. Hanington, Canada.	G. H. Simmerman, New Jersey.
M. P. Harrington, Canada.	E. H. Slocum, New Jersey.
W. D. Hays, Pennsylvania.	I. V. Smith, Virginia.
O. L. Hertig, Pennsylvania.	A. J. Timmons, Maryland.
H. S. Hollenback, Pennsylvania.	Santiago Uribe, U. S. Columbia.
Mortimer Hopkins, New York.	J. S. Voegtlen, New Jersey.
W. J. Hottenstein, M. D., Penna.	F. D. Wattson, Pennsylvania.
E. K. Hottenstein, M. D., Penna.	A. G. Weber, Cuba.
H. F. Jordan, M. D., Mississippi.	Ignatius R. Weber, Cuba.
Gust Joachim, Germany.	J. F. Wessels, Jr., Pennsylvania.
J. D. Kendig, Pennsylvania.	H. C. Wetmore, Canada.

## LAKE FOREST UNIVERSITY—CHICAGO COLLEGE OF DENTAL SURGERY.

The eighth annual commencement exercises of the Chicago College of Dental Surgery (Dental Department of Lake Forest University), were held at the Chicago Opera House, on Tuesday, March 25, 1890.

The annual report was read by the Dean of the College; conferring of degrees, by Truman W. Brophy, M. D., D. D. S., President. The class valedic-

tory, by Will Loyd Jones, D. D. S.; faculty address, by A. W. Harlan, M. D., D. D. S.; Address, by W. C. Roberts, D.D., LL. D., President of Lake Forest University.

The number of matriculants was 254.

The degree of Doctor of Dental Surgery was conferred on the following named (60) gentlemen :

\*Charles Edward Austin, B. Sc.  
 Frederick Douglas Axton.  
 James Down Banes.  
 Daniel Wesley Bottorff.  
 John Henry Chase.  
 Joseph William Dostal.  
 William Edward Emmons, L. D. S.  
 Allen Benjamin Fernald.  
 Harvey Everett Follansbee.  
 Obe Edward Gibson.  
 Linneaus Melbourn Goodearle.  
 \*Earl Evlin Gould.  
 Frank Albert Green.  
 Edwin Grant Howard.  
 Frank Sylvester Heer.  
 Will Lloyd Jones.  
 Richard Kempter.  
 Halbert Eaton Kinney.  
 \*Frank Kolar.  
 Ernest Lincoln Knapp.  
 Frank Ambrose Lane.  
 \*James Truman Lennington.  
 Michael Leininger.  
 Charles Beatty Magill.  
 James Ralph Maguire.  
 George Bruce Martin.  
 Almon Green Moffett.  
 James Doyle Moore.  
 Joseph Gregory Pflaff.  
 Guy M. Phelps, M. D.

John James Pountain.  
 \*Harry Monroe Prickett.  
 \*John Willett Putnam.  
 Frederick Kent Ream.  
 Edmund Walter Russell.  
 Otto August Ruthenberg.  
 Charles Carver Ryan.  
 Grant John Roberts.  
 Fenwick Earl Salisbury.  
 Frank Steece Schadel.  
 James Adam Shoemaker.  
 Albert Gustave Seeglitz.  
 Jacob Hamlin Smyser.  
 Melvin Wellington Swartz.  
 Frederick Richard Suggitt.  
 \*Lewis Solomon Tenny.  
 Frederick Solomon Tinslar.  
 George Wilson Toles.  
 Cornelius Nicholas Trompen.  
 Rollin Brede Tuller.  
 Orrin Thompson.  
 James Lincoln Ubellar.  
 John Quigley Waddell.  
 Charles Herbert Waterhouse, M. D.  
 Charles Edward White.  
 Herbert Cameron West.  
 William Henry Conrad Wiesler.  
 Charles Augustus Whitenack.  
 Edward Everett Williams.  
 George Edwin Zinn, B. Sc.

\*Certificates of honor for attendance on one Spring Course of Lectures.

#### KANSAS CITY DENTAL COLLEGE.

The eighth annual commencement exercises of the Kansas City Dental College were held at the Y. M. C. A. Auditorium, Kansas City, Mo., on Wednesday evening, March 12, 1890. The faculty address was delivered by Prof. C. L. Hungerford. The annual address was delivered by Maj. L. K. Thacher. Conferring degrees and distribution of prizes, by C. B. Hewitt, D. D. S. Valedictory address, by R. C. Hutcheson, M. D., D. D. S. Number of matriculates, 73.

List of (16) graduates :

William Samuel Barker.  
 Alonzo Marion Buckley.  
 James Reed Campbell.  
 Frank Lund Ewing.  
 Charles Henry Gant.  
 Samuel Martin Gant.  
 James Edmund Hawthorn.  
 Robert Charles Hutcheson, M. D.

Clarence Edgar Johnson.  
 Shirley Sexton Millett.  
 William Sherman McDonald.  
 Frank Lorenzo Overstreet.  
 Henry Johnson Pfister.  
 Carl Ernest Sihler.  
 Charles Respass Spruill.  
 William Wallace Williams



## MISSOURI DENTAL COLLEGE.

The Twenty-fourth Annual Commencement exercises of the Missouri Dental College, were held at Memorial Hall, St. Louis, on Thursday evening, March 13, 1890.

The annual address to the class was delivered by Prof. J. P. Bryson.

The number of matriculants for the session was seventy-nine.

The degree of Doctor of Dental Surgery was conferred on the following (33) graduates by Prof. W. H. Eames:

William H. Auer, Mo.  
 Thomas T. Baker, Ill.  
 Walter M. Bartlett, Mo.  
 Edward W. Bear, Mo.  
 Albert G. Bowman, La.  
 Frank Henry Caughell, Mo.  
 William A. M. Cumming, Ill.  
 John E. Deggendorf, Mo.  
 Warden B. Dennis, Jr., Ill.  
 Peter Henry Eisloeffel, Mo.  
 Henry D. Feild, Mo.  
 John W. Forden, Ill.  
 John J. Greer, Mo.  
 Edwin C. Hammen, Mo.  
 Guilford B. Houston, Mo.  
 Frank A. Kimler, Ill.  
 Paul W. Keller, Mo.

Frank M. Lowry, Ill.  
 Marcus A. Mace, Ill.  
 Peter H. Morrison, Mo.  
 Lorenz A. Naumann, Mo.  
 Charles W. Ott, Kas.  
 Theodore L. Pepperling, Mo.  
 Thomas N. Perrine, Ill.  
 Harry W. Pierce, Ind.  
 James H. Prothero, Neb.  
 Edward Schrantz, Mo.  
 Thomas E. Turner, Ill.  
 Edgar M. Whitsett, Mo.  
 Frederick V. Waldron, Pa.  
 Francis W. Willard, Ill.  
 Joseph Carter Goodrich, Mo.  
 Benjamin Q. Stevens, Mo.

## GERMAN-AMERICAN DENTAL COLLEGE OF CHICAGO.

The first annual commencement exercises of this institution were held at Kretschmer's Hall, 625 North Clark street, Chicago, on Saturday, March 15, 1890. The annual address was delivered by Prof. F. Brunhoff, the valedictory address by Dr. George Guttman. The degree of Doctor of Dental Surgery was conferred on the following named (5) gentlemen:

George Guttman.  
 Oscar Abert.  
 Franz von Guerard.

Edmund Weber.  
 Philip Orth.

## SOUTHERN MEDICAL COLLEGE—DENTAL DEPARTMENT.

The third annual commencement exercises were held at De Give's Opera House, Atlanta, Ga., on March 5, 1890. During the year there have been sixty matriculants. The degree of Doctor of Dental Surgery was conferred by the President of the University, Dr. Thomas S. Powell, on the following named (13) candidates:

H. J. Arbeely, Syria.  
 T. F. Braunan, Georgia.  
 W. F. Blassingame, Georgia.  
 C. K. Chapman, Georgia.  
 J. C. Cato, Georgia.  
 J. R. Dedge, Georgia.  
 J. T. Gordon, Georgia.  
 A. L. Griffin, Georgia.

C. W. Hendry, Georgia.  
 Y. H. Landry, Louisiana.  
 E. J. McIver, Georgia.  
 C. H. Parish, Georgia.  
 D. Roberts, Georgia.  
 W. S. Simmons, Georgia.  
 E. G. Thomas, Georgia.

## UNIVERSITY OF CINCINNATI—DEPARTMENT OF DENTISTRY.

The forty-fourth annual commencement exercises of this, the old Ohio College of Dental Surgery were held at the Scottish Rite Cathedral, Cincinnati, O., on Wednesday evening, March 12th, 1890.

Prizes were awarded by Prof. H. A. Smith, Dean of the Faculty, as follows:

- Prizemen { Best general examination, B. A. Wright, of Penna.  
 { Best attainments in Operative Dentistry, R. McClanahan, of Ind.  
 { Best attainments in Prosthetic Dentistry, A. G. Herr, of Michigan.

An address was delivered by the Rev. Howard A. Johnston, and the class oration by William H. Wernett.

The number of matriculants was 161. The degree of Doctor of Dental Surgery was conferred by James Leslie, D. D. S., on the following (66):

Frank Ehret Adams, Ohio.	Isaac Edward Josephis, Pennsylvania.
Benjamin Quict Ayres, Ohio.	Atsubiko Katayama, Japan.
Edmund George Beal, Pennsylvania.	Samuel Dora Laughlin, Kentucky.
Michael August Becker, Ohio.	James William Leahy, Ohio.
Harry Ruthven Bell, Ohio.	Allen Joseph Lee, Kentucky.
Willie Morton Bogue, Indiana.	Richard Morgan, Jr., Missouri.
Carl Edward Booren, Minnesota.	Fermine Engle Morgan, Ohio.
Homer C. Brown, Ohio.	John Gilpin Macy, Ohio.
Stephen Abner Brown, Pennsylvania.	Russell McClanahan, Indiana.
Dalton D. Cunningham, Pennsylvania.	Horace Edwood McClelland, Ohio.
Charlie C. Carle, Ohio.	Thomas Harris McClure, Pennsylvania.
William James Crampton, Canada.	James Elmo Nichols, Canada.
Fred. Leslie Cauch, California.	James Gilmore Parr, Ohio.
James Hamilton Clark, Ohio.	Clarence Courtland Pollitt, Kentucky.
Herbert Everett Crocker, Connecticut.	J. Harbin Pollock, Ohio.
Isaac Stanton Carter, West Virginia.	Adam Burr Purdy, Canada.
J. F. Cope, Pennsylvania.	Elmer W. Ream, Indiana.
Jacob Jones Donaldson, Pennsylvania.	Charles Lawrence Rose, Minnesota.
Sidney Allen Donaldson, Kentucky.	Frank Stanley Rose, Canada.
Max M. Eble, Kentucky.	Moritz Carl Saul, Germany.
Adolph Eicke, Germany.	Franklin N. Seeley, Ohio.
Bartlett Joseph Emery, Ohio.	Lewis S. Seeley, Ohio.
Hampton Geiger, Ohio.	James Wilbur Shane, Ohio.
Hugh Peebles Gillispy, New York.	Charles Frederick Shober, Canada.
W. Ohmer Girardey, Ohio.	J. August Shober, Canada.
William Clifford Griffith, Ohio.	Albert Sidener, Ohio.
Daniel Ephram Hartwell, Indiana.	James A. Sinnett, Ohio.
W. Howard Hayden, Ohio.	Moses Shobe Smith, Kansas.
Charles Lee Hill, Ohio.	Claude Henry Thompson, Ohio.
William Henry Houser, Ohio.	William H. Wernett, Ohio.
Abraham Gantz Herr, Michigan.	Lorne Wilkie, Michigan.
Virgil Newton Jones, West Virginia.	Edwin John Witherspoon, Michigan.
William Irwin Jones, Ohio.	Bayard Alvin Wright, Pennsylvania.

## NEW YORK COLLEGE OF DENTISTRY.

The twenty-fourth annual commencement exercises of the New York College of Dentistry were held at Chickering Hall, New York, Tuesday evening, March 11, 1890.

The degree of Doctor of Dental Surgery was conferred by William T. La Roche, D. D. S., Vice-President of the Board of Trustees; awarding of prizes by F. Le Roy Satterlee, M. D. Ph. D. The valedictory address was delivered by

Manly Collard Burns, D. D. S., of the graduating class; the address to the graduates by Rev. George Alexander, D. D. The following is a list of the (80) graduates;

De Lancy Bradner Armstrong.	Charles Brodhead Kenney.
Francisco Genaro Bruno.	Roswell Delancey King.
Alfred Bartels.	Louis Wixon Kennard.
Edward Howard Babcock.	Hurbert Aria Lewis.
George William Baab.	Charles Fredrik Josef Lundgren.
Edwin Betts.	James Buckley Locherty.
Manly Collard Burns.	Charles Carroll Linton.
Charles Edwin Baldwin.	Oscar Benjamin Lopez.
Joseph Robert Bomann.	William John Macom.
Lewis Clarence Baldwin.	Otto Mattes.
James Dawson Cook.	Fred Harry Martin.
Homer Cecil Croscup.	Ferdinand Miller.
Frank Titsworth Clawson.	William Hopkins Merritt.
William Greer Clark.	Edward O'Neill.
Alfredo Duran.	Nelson Mangam Pattison.
Alfred Williston Davisson.	Stephen Palmer.
William Henry Draper.	Ellis Frank Potter.
Wilber Manton Dailey.	George Bender Poole.
Arthur Eugene Davenport.	Louis Simon Rosenstiel, Jr.
Myron James Dixon.	Frank Aloysius Ryan.
William Romanoff Dunster.	William Arja Rowlands.
Lewis Everett Estler.	Harry Johnson Sinclair.
Edward Eberle.	Julius Joseph Stier.
James Samuel Eckley.	Paul Shoenemann.
George Henry Euler.	William Polly Sullivan.
Frank Wroe Eichhorn.	Walter Clinton Spooner.
George Alfred Fournier.	Henry Augustin Spang.
Charles Andrew Fones.	William Augustus Strong.
Frederick Ernest Adolph Faber.	Frank Russell Stillman.
Ossian Lucerne Field.	Arthur Hamilton Smith.
Andrew Graham.	William John Schreiber.
Jose Guillermo Guetierrez.	Thomas Andrew Sproat.
Ferdinand Walter Griebel.	Henry Paul Travers.
Francis Gray.	Frank Seymour Van Nostrand.
Ellis Allan Grossmann.	John William Van Doorn.
George Alfred Hull.	William Leslie Weed.
Chester Thomas Hustis.	Frank Edmund Weber.
Thaddeus Pomeroy Hyatt.	John Raymond Westervelt.
John Julien.	Horace Nevertton Warren.
Harry Colby Kahlo.	Julius Zietz.

#### HOWARD UNIVERSITY—DENTAL DEPARTMENT.

The fourth annual commencement exercises of the Dental Department of Howard University were held at the Congregational Church, Washington, D. C., on Friday evening, March 14, 1890. The address to the graduates was delivered by Prof. Charles B. Purvis, A. M., M. D. The degree of Doctor of Dental Surgery was conferred on the following named (7) gentlemen:

William M. Ash.	James H. Holsey.
Andrew J. Brown.	Robert J. Macbeth.
Arthur T. Cooper.	George A. Thompkins.
Isaac C. Edington.	



## STATE UNIVERSITY OF IOWA—DENTAL DEPARTMENT.

The eighth annual commencement of the Dental Department of the State University of Iowa was held at the Opera House on Monday, March 10, 1890. The annual address was delivered by the Hon. R. G. Cousins, of Tipton, Iowa. The degree of Doctor of Dental Surgery was conferred by the President, Charles A. Schaeffer, Ph. D., on the following named (43) candidates:

T. G. Albin, St. Louis, Mo.	F. B. Kremer, Caledonia, Minn.
J. V. Anderson, Cambridgeboro, Pa.	R. E. Lamoreaux, Ashland, Neb.
F. J. Bethel, Denver, Col.	F. H. Low, Waukon, Ia.
A. D. Barker, Grinnell, Ia.	W. B. Mandeville, Austin, Minn.
Benton Bement, Lockport, N. Y.	Edward Morton, Iowa Falls, Ia.
C. E. Booth, W. Superior, Wis.	W. F. McDonald, Mt. Pleasant, Ia.
C. M. Cobb, Clear Lake, Ia.	Chas. R. McCandless, Davenport, Ia.
C. E. Colman, Decorah, Ia.	W. E. Mabee, Sheldon, Ia.
G. W. Cook, Hyde Park, Ill.	G. C. Marlow, Lancaster, Wis.
Chas. Dorman, Manchester, Ia.	E. H. Naumann, Oxford Junction, Ia.
Andrew Dingwell, DeWitt, Ia.	H. O. Rogers, Ottumwa, Ia.
J. H. Dorival, Caledonia, Miss.	G. W. Schwartz, M. D., Nebraska City.
F. E. Davoll, Madison, Dak.	S. L. Seeley, Manchester, Ia.
J. W. Gluesing, Moline, Ill.	Richard Summa, St. Louis, Mo.
Nathaniel Glasgow, Maxwell, Ia.	W. H. Simpson, Bellevue, Ia.
C. H. Gibson, Chaska, Minn.	C. D. Tiffany, Mason City, Ia.
R. H. Guy Huntley, Mason City, Ia.	E. A. Taylor, Villisca, Ia.
J. G. Hildebrand, Waterloo, Ia.	P. L. Van Winter, Tacoma, Wash.
J. W. Hubbard, Muscatine, Ia.	H. Van Winter, Marshalltown, Ia.
Harriet Mabel Jones, Winterset, Ia.	T. B. Wallace, Morrison, Ia.
W. H. Jallings, Washington, Minn.	Hattie E. Wells, Perry, Ia.
Claude Kremer, Mabel, Minn.	

## AMERICAN COLLEGE OF DENTAL SURGERY.

The fourth annual commencement exercises of the American College of Dental Surgery, were held in Recital Hall, Auditorium Building, Chicago, on March 26, 1890. John Sanford Batchelor, D. D. S., delivered the valedictory address. The president of the college, L. D. McIntosh, M. D., D. D. S., conferred the degrees, and the doctorate address was delivered by Gustavus North, A. M., D. D. S. The members of the graduating class (27) are:

Charles H. Albrecht,	T. A. Mayhew,
F. E. Koski,	P. S. Kirk,
J. L. Finklesten,	H. L. Hedger,
F. E. Graef,	S. T. Holmes,
S. P. Bevier,	C. E. Drummond,
L. E. Ireland,	C. Schroeder,
F. J. Phipps,	T. F. McKey,
S. T. Currier,	L. L. Funk,
W. T. Kelly,	C. F. Ray,
R. A. Gardner,	S. W. Boetticher,
J. B. Dowling,	A. N. Ferris,
F. S. Newton,	J. S. Batchelor,
E. C. Tobler,	W. H. Pontius.
B. R. Wilson,	

The honorary degree of D. D. S., was conferred on J. J. Barber, I. Clendenen and C. F. Hartt.

## UNIVERSITY OF MARYLAND—DEPARTMENT OF DENTAL SURGERY.

The eighth annual commencement exercises of this department were held at the Lyceum Theater in Baltimore, Md., on Wednesday, March 19, 1890.

Reading of Mandamus by the Dean, Prof. Ferdinand J. S. Gorgas, M. D., D. D. S.

Conferring of Degrees and Award of Prizes, by the Hon. S. Teackle Wallis, LL. D., Provost of the University.

The address to the graduates was delivered by the Rev. Elbert S. Todd, D. D. Class Oration, by Harvey E. Glatfelter.

Number of matriculants for the past session, 135. The degree of Doctor of Dental Surgery was conferred on the following named (44) persons:

David Aiken, S. C.  
J. Maurice Ayer, N. C.  
John R. Berry, Va.  
William E. Beachley, Md.  
William C. Boswell, Jr., Md.  
Charles T. Breedlove, Ark.  
William Stevens Brown, Jr., S. C.  
Oscar Frank Byrd, Va.  
Stuart Cassard, Md.  
William H. Collins, Va.  
St. George T. Craig, Ky.  
Wray Wythe Davis, Va.  
L. Thornwell Emerson, Brazil, S. A.  
Charles Felker, N. Y.  
Henry J. Fenn, N. Y.  
Isaac Watts Furman, N. Y.  
Harvey Edward Glatfelter, Pa.  
Charles Carroll Graham, Texas.  
J. William Graves, Mo.  
N. Robert Hubbard, Pa.  
Aaron Victor Huntzberg, Md.  
W. Spry Hurlock, Md.

Robert L. Harley, S. C.  
William A. King, Canada.  
Daniel O. M. LeCron, Ia.  
John L. Luke, Va.  
J. Henry Marchant, Va.  
Otis H. McDonald, Ga.  
James Elijah McNeal, Md.  
Thomas P. Meyer, Pa.  
Charles Mezger, Ph. G., Md.  
Laurent S. Mitchell, N. J.  
William W. Morgan, N. J.  
Charles Grant Meyers, N. Y.  
George Harkness Perrin, Canada.  
William Adams Pressley, N. C.  
Charles B. Renoe, Mo.  
Halsey G. Steer, N. Y.  
Sylvanus Claude Sykes, Md.  
F. Foster Todd, Md.  
Charles B. Whelpley, Canada.  
Charles Edmund Wogan, Pa.  
George Woolsey, Cal.  
Clarence Angelo Wright, N. H.

## COLUMBIAN UNIVERSITY—DENTAL DEPARTMENT.

The third annual commencement exercises of the Dental Department of Columbian University, were held at Albaugh's Grand Opera House, Washington, D. C., on Thursday, March 20, 1890.

The degree of Doctor of Dental Surgery was conferred by President J. C. Welling upon the following (5) candidates:

Stephen B. Cassin, of D. C.  
Mrs. Jessie Kappeler, of England.  
Charles M. O'Leary, of D. C.

John L. Reid, of D. C.  
Thomas W. Stubblefield, of D. C.

The address to the graduating class was delivered by Dr. H. B. Noble, of Washington, D. C. Music by the Marine Band.

This young school has, since the last session, adopted a high standard of qualifications, requiring *three* years of study and clinical work, and a preliminary examination as to previous education. Though its numbers have thereby been materially reduced, it may be hoped, in the interest of better qualifications for graduation, that this reduction will be only temporary.

## ROYAL COLLEGE OF DENTAL SURGEONS OF ONTARIO.

The closing exercises of the College were held in Normal School Hall, Toronto, on the evening of the 28th of March, 1890.

Matriculated students in attendance during the session, 71.

The Valedictory Address was delivered by Wm. Mills, L. D. S. The address to the graduating class by Dr. J. B. Willmott, Dean of the Faculty. A general address was given by Dr. W. Geo. Beers, of Montreal.

H. T. Wood, M. D. S., President of the Board of Directors, presented the Diploma of the College conferring the title of L. D. S. to the following persons:

G. P. Allen.

J. A. Armstrong.

D. Allen Black.

Thos. Butler.

Geo. F. Belden.

M. F. Binkley.

A. Stanley Burns.

Ira Bower.

Milton Cavanagh.

J. F. W. Chittenden.

Denton Dulmage.

C. M. French.

Benjamin Gollop.

W. R. Hamilton.

John H. Johnston.

Oliver Martin.

Archibald Milloy.

Sylvester Moyer.

William Mills.

W. D. MacLaren.

Walter F. McPhee.

M. G. McElhinney.

Alfred T. Pearson.

William Revell.

Wesley Richardson.

M. W. Sparrow.

James F. Simpson.

W. H. Steele.

W. J. Trotter.

A. W. Thornton.

F. W. Twedde.

J. J. Wisser.

All of the Province of Ontario, Canada.

And the Diploma of Master of Dental Surgery upon J. P. Marshall, L. D. S.

## PRACTICAL NOTES.

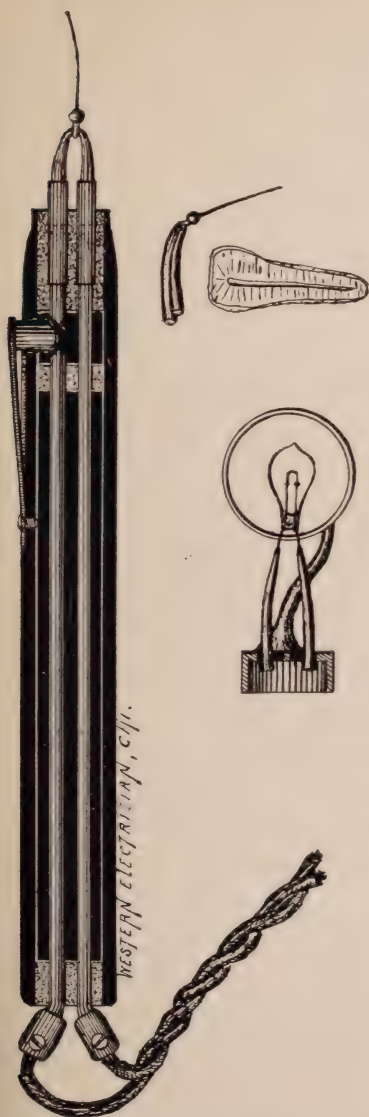
## ELECTRIC ROOT CANAL DRYER WITH LAMP AND CAUTERY ATTACHMENT.

By T. L. GILMER, M. D., D. D. S., Chicago, Ill.

The instrument represented by the cut meets one of the needs of the dentist, which is a means whereby root canals may be easily and thoroughly dried. At the same time the handle is constructed so as to carry either a small mouth-lamp with mirror attached, or a small cautery. Formerly I made the loop by diminishing at the bend a platinum wire as shown in the cut, and soldered the point to the loop with pure gold, and as a reservoir of heat, melted a globule of gold upon the point near its attachment with the loop, but later have adopted another method which is far preferable. I found that unless the loop was greatly diminished at the bend, too great a current of electricity was necessary to produce the requisite



amount of heat. If it were too much reduced the loop lacked stiffness and was not easily handled. That a smaller wire may be used,



the loop is covered with molten glass to give the required stiffness; also by the same means the point is secured to the loop. The glass thoroughly unites the loop and the point. The small wire of which the loop is composed, is soldered to two posts which fit into the sockets of the conducting rods. The method of using the instrument is as follows: A loop with a suitable sized point being inserted in its sockets, the circuit is closed by touching the key with the forefinger and the heat regulated to any desired degree by continued pressure for the maximum amount, and an intermittent closing and opening of the circuit where a lighter heat is required. The point may be introduced in the canal before closing the circuit and the heat generated after its application, but I usually generate the heat necessary before applying it and then prolong and regulate it at pleasure by closing and opening the circuit. When a lamp is desired, the canal drying-point with its loop is removed and in its place are inserted the wires of the lamp. The mirror (which affords protection to the tongue or cheek from the lamp, and also acts as a reflector), is slipped on the handle. If a cautery is desired,

a loop of fine platinum wire is inserted in the conducting rods. The small wire is instantly heated to any desired temperature by

applying the current. I use two cells of Pumpelly's storage battery, giving four volts. This supplies sufficient current to heat the wire for drying canals or for cautery purposes. A three-volt lamp is used, and the current is reduced for this purpose by using smaller connecting wires. The cut was kindly loaned by the *Western Electrician*.

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### MEMORANDA.

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Iowa State Dental Society meets at Dubuque, May 6-9.

Texas State Dental Association meets at Belton, May 6-9.

Nebraska State Dental Society meets at Omaha, May 20-23

Kansas State Dental Association meets at Topeka, April 29 to May 2.

We are again compelled to defer much interesting matter until next month.

The Delta Sigs held a banquet Monday evening, March 24th, about 75 being present.

The Michigan State Dental Association will convene June 3, 4 and 5, at Jackson.

Five reports of college commencements must lay over till next month, for want of space.

Dr. Wm. Croll has changed his London address to No. 7 Wimpole St., Cavendish Square, W.

An International Dental Congress—of course in Chicago. Well, where else could it be held?

The Southern Dental Association will meet this year in Atlanta, the 15th of July. Mark it down on your appointment book.

The *Skandinavisk Tidskrift for Tandlakare*, the only dental journal published in the Swedish language, has been discontinued.

Dental Section of the American Medical Association meets at Nashville, Tenn., May 20-23. No notice of meeting has been sent to the REVIEW.

The fourteenth annual meeting of the Nebraska State Dental Society, will be held at Omaha, May 20-23.

H. J. COLE, Pres.

The Illinois State Dental Society meets at Springfield, May 13. The Executive Committee and the Superintendent of Clinics, have prepared an interesting programme.

English as she is advertised in a Japanese paper: "This teeth powder is not common thing, as be sold in the world, it is powerful to hold the health of teeth, and recover the teeth from its sick. If you only examine should find that it never tell a lie.—*Exchange*.

In 1888, M. de Laponge, of Montpellier, France, obtained 150 tolerably perfect skulls from the soil of a cemetery used for interments from the seventeenth century until 1830, and has made an elaborate series of comparative cranio-metric measurements with them.

We will shortly publish an excellent biography of Dr. Horace H. Hayden, prepared by his grandson, Rev. Horace Edwin Hayden, for the Hayden Dental Society of Chicago.

It is purposed to make dental inspection of the teeth of the children in the public schools of Detroit, Mich., to deliver lectures to the pupils and to educate them in regard to their dental organs. An inexpensive set, consisting of tooth-brush, powder, floss silk, etc., is to be placed on sale, to accommodate them and to enable them to put to practical use what they learn from the lectures.

As inappropriate as a "Memorial Meeting of the American Dental Association in 1892" would be, THE DENTAL REVIEW might agree to support such a preposterous hobby of the *International Dental Journal*, were it not for the fact that, judging from its wavering course, that journal may want to change the name, the time or the character of the meeting as often as it may suit its fancy between now and then.

Chloralvide, the new hypnotic, is declared by Dr. S. A. Strahan, a certain sleep-producer and at the same time safe and agreeable. Its action is almost identical with that of chloral, without that depressant influence on the heart which renders chloral so dangerous in many cases. In doses of from thirty to fifty grains it induced sleep in almost every case in which Dr. Strahan used it; even in patients suffering from sub-acute mania, or from the excitement or restlessness following epileptic seizures. Dr. Strahan thinks the drug may prove an allayer of pain as well as an inducer of sleep.—*Medical Ex.*

The Dental Protective Association is progressing nicely. There is a large membership, and a large amount of testimony ante-dating all patents owned by the International Tooth Crown Company. The company has not sued any member of the association, nor proceeded with any of the old suits taken charge of by the association. They guarantee protection against any of their patent claims, also to take charge of suits and pay expenses. The membership fee is only \$10, but will be increased soon. It is quite a flattering statement that we can make, namely: that there is not a single licensee in Chicago.

The Eastern Illinois Dental Society held a two-days' meeting in Mattoon, Ill., March 18 and 19, 1890. The meetings were presided over by President Waltz, of Decatur, and interesting and successful clinics were performed by Drs. Blackshaw, of Urbana; Patton, of Springfield; Reed, of Paxton; Damron, of Arcola; Hutton, of Hoopston; Brooks, of Charleston, and Lumpkin, of Mattoon. G. H. Shafer, of Champaign, was elected President for the coming year; J. A. Lumpkin, of Mattoon, Vice-President; George H. Damron, of Arcola, Secretary; S. A. Campbell, of Mattoon, Treasurer, and Drs. Reed, of Paxton, Brooks, of Charleston, and Blythe, of Decatur, members of the Executive Committee. The meeting next year will be held in Paxton.

SAN FRANCISCO, Cal., March 22.—Dr. J. M. Whitney, of Honolulu, who arrived here on the steamer *Australia* yesterday, states that Sister Rose Gertrude, the English girl who was anxious to nurse lepers at Molokai, will not become an exile in the leper settlement, and perhaps die there, as she anticipated. The settlement of Molokai is in charge of Sisters of the Sacred Heart, who are maintained there by the Hawaiian Government, and as Sister Rose Gertrude belongs to another order, the Dominican Sisters, she could not be admitted. She is,



therefore, at Kalili, a receiving station for lepers or those who are supposed to have contracted the disease. There they are cared for until it can be determined what their ailment really is. Dr. Whitney states she is comfortable at Kalili and not isolated, though she is disappointed in her expectations.—*Exchange*.

Dr. Whitney will be remembered by readers of the DENTAL REVIEW as an erstwhile contributor to its columns.

EXCHANGE—First-class dentistry for a good sewing machine. Address H 147, Tribune.

EXCHANGE—First-class dentistry for printing. Address H 149, Tribune.

EXCHANGE—First-class dentistry for paper-hanging. Address H 150, Tribune office.

BOARD—First-class dentistry in exchange for board and room. O 36, Tribune office.

TO EXCHANGE—Dentistry for a sewing-machine. M 59, Tribune.

TO EXCHANGE—First-class dentistry for lady's gold-watch. N 145, Tribune office.

TO EXCHANGE—First-class dentistry for board. N 146, Tribune office.

The foregoing advertisements are clipped from *one* issue of *one* of the Sunday papers published in Chicago.

WANTED—To exchange, any of the above first-class dentists for a good mule, a lawn mower or a cook-stove.

A plan under which the work of the various sections of the American Dental Association should be done is being elaborated by the section to which this subject was referred at the last meeting of the Association. The secretaries of the various dental societies are requested to prepare (or have some competent member of the society do so) a brief, concise synopsis of the work of the society. This should include extracts from the papers read and from the discussions following, and should include mention of every item of scientific value brought forward during the meeting of the respective societies, a description of new instruments, appliances, and in fact a mention of *everything* worthy of notice. These reports should be sent, as soon as possible after the adjournment of the meeting of the respective societies, to the Secretary of Section II, A. D. A. (Louis Ottofy, 70 Dearborn street, Chicago). They will then be separated and sent to the respective chairmen of the various sections. In this way the chairman of each section will receive a report of everything that has been accomplished by the different societies of the United States in the particular branch represented by his section. The sections will then prepare their reports from these State and local reports and thus present an entire exhibit of the profession's advance and labor during the year. The societies which contribute to the accomplishment of this object will receive due credit in the report of each section.

#### ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The Illinois State Board of Dental Examiners will meet at the State House in Springfield, on Monday, May 12, 1890, at 10 o'clock, a. m. Candidates for examination will present themselves before 2 p. m. of that day.

C. STODDARD SMITH, Secretary.

## MINNESOTA STATE DENTAL ASSOCIATION.

The Minnesota State Dental Association will hold its seventh annual meeting in Minneapolis, Wednesday, Thursday and Friday, July 9th, 10th and 11th, 1890.

M. G. JENISON, Cor. Sec.

## IOWA STATE DENTAL SOCIETY.

The twenty-eighth annual meeting of the Iowa State Dental Society will be held in Dubuque, Iowa, May 6th to 9th, 1890. All are invited to be there and help in "the advancement of Dental Science" and Art.

GEO. W. MILLER, Sec.

## CHICAGO DENTAL SOCIETY.

At the annual meeting of the Chicago Dental Society, held on Tuesday, April 1, 1890, the following officers were elected for the ensuing year: President, C. N. Johnson; First Vice-President, C. H. Thayer; Second Vice-President, I. A. Freeman; Secretary, A. E. Baldwin; Corresponding Secretary, T. L. Gilmer; Treasurer, E. D. Swain; Librarian, A. W. Harlan. Geo. H. Cushing, to succeed himself on the Executive Committee; C. F. Hartt, E. A. Royce, and S. B. Palmer, Board of Censors.

## TEETH PULLED BY HENS.

Virginia is thus far the only known State which boasts of hen dentists. Some time since the Page County *Courier* published an account of a hen there angrily flying at a farmer and pulling out one of his teeth. George E. Heath, who lives in Hanover County, a short distance from Ashland was in the city to-day. He states that on Saturday morning he went to his hennery and attempted to take a hen off her roost, when she flew in his face, pecked him in his mouth, and took out a tooth which had been troubling Mr. Heath for some time and which he intended having extracted. This is the second hen-dentist in Virginia.—Richmond Special in the *Norfolk Landmark*.

## OLD-FASHIONED TOOTH-PULLING.

Did you ever sit down in a dentist's chair, reader, with the naked forceps glittering above your head, and all your faculties and senses abnormally alert; did you ever sit down thus and open your mouth and point to one of those old, double-crowned cuspids that, like ice-burys, submerge three-fourths of their bulk out of sight, and are more deeply rooted in the constitution of man than original sin; did you ever, we say, sit down thus, in the days before anæsthetics had mitigated the barbarities of dentistry, and say to that man, who is literally a man of steel: "This is the tooth. Take a good grip and haul away?"

If you have, you will know how your grandfather used to feel when he went to the village doctor to have a bad tooth extirpated.

The stalwart son of Æsculapius was wont to lean back upon the forceps and tug, and jerk, and saw like a man trying to rein in a runaway horse. Your grandfather grasped the arms of the chair in which he was imprisoned, and squeezed them until his joints cracked, in order to keep from yelling. But the agony kept getting worse and worse. The victim was sure he was going to die—when, all of a sudden, the top of his head came off with a roar; the planetary system rushed together in one vast cosmic salad, and lifting his bewildered eyes for a moment to the disembodied source of his misery, the patient leaned over and discharged a pint of blood into the dentist's basin.—*Burlington Free Press*.

## PROGRAMME OF THE ST. LOUIS DENTAL SOCIETY FOR 1890.

January 7th.—Annual meeting: election of officers.

February 4th.—Installation of officers: addresses by the newly elected and retiring presidents.

February 18th.—Dr. H. H. Keith, "Incidents in Practice."

March 4th.—Dr. Wm. N. Morrison, "Novelties"

March 18th.—Dr. Wm. H. Eames, "Morphology of the Dental Tissues."

April 1st.—Dr. J. Warren Wick, "Bleaching Teeth."

April 15th.—Dr. George A. McMillen, "Dental Motors."

May 6th.—Dr. M. C. McNamara, "Preservation of Natural Teeth, by his own Method."

May 20th.—Dr. Wm. Conrad, "Removing Broken Instruments from Root Canals."

June 3d.—Dr. DeCoursey Lindsley, "Soft Foil."

June 17th.—Dr. A. H. Fuller, "Professional Ethics."

July 1st.—Dr. Geo. Robitoy, "Contour Filings."

September 16th.—Dr. E. S. Ulman, "Neuralgia."

September 30th.—Dr. John J. R. Patrick, "Follies in Dentistry."

October 21st.—Dr. Henry Fisher, "Practical Dentistry."

November 4th.—Dr. John G. Harper, "Porcelain, and Porcelain Faced Crowns."

November 18th.—Dr. J. B. Newby, "Dentistry; Past, Present and Future."

December 2d.—Dr. A. J. Prosser, "Dental Education."

December 16th.—Annual dinner.

Members to open the discussion will be selected by the essayists.

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## OBITUARY.

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DR. H. H. WINN.

Died, at Hong Kong, China, February 8th, 1890, of tuberculosis, Henry Holmes Winn, D. D. S., aged 49 years.

Dr. Winn was born at Walthourville, Georgia, June 2d, 1840. He began the study of dentistry in the year 1860 with Dr. Motter, of Henry, Illinois, and graduated from the Ohio College of Dental Surgery in 1865. He first practiced in Canton, Illinois, where he remained until September of the same year (1865), when he went to Yokohama, Japan. After conducting here successfully a practice for some years, and later in Hong Kong, China, he removed to Shanghai in 1873, which place he has since made his home.

At the time of his death he was associated in partnership with Dr. R. H. Kimball, having offices in Shanghai, Hong Kong and Yokohama, and was the senior and probably best known dentist in that part of the world.

In his profession, which he greatly loved, he was a painstaking, conscientious laborer, and the high esteem with which "American Dentistry" is regarded in the far East is due in a very large degree to his skill and thoroughness in every department of his chosen work.

His wife and five children survive him.



# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, MAY 15, 1890.

No. 5.

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## ORIGINAL COMMUNICATIONS.

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### WHO SHALL DECIDE?\*

BY ELECTUS B. WARD, M. D., D. D. S., CHICAGO, ILL.

There is perhaps no question of greater importance now before the Dental world, or one that challenges more immediate attention, than that expressed in the interrogation. Who shall decide as to the qualifications of candidates for graduation from our Dental Colleges, or who shall be legally authorized to issue diplomas licensing the successful candidates to practice the science and the art of their chosen profession? In other words, shall the faculties of our respective colleges continue to be the judges as to the student's fitness to receive a license to practice, or shall such powers and privileges be vested in a separate and distinct Board of Examiners, appointed either by the State government or the respective State societies? Both views have their advocates and supporters, and it is needless for me to add from what sources the two factions draw most largely their different following.

During the course of a long student's life I have ever found it a source of great pleasure and profit to carefully and impartially consider subjects that have from time to time occupied the scientific or popular mind. Such a course I believe to be not only a privilege but a duty devolving upon every member of society, for the axiom was long since established that inasmuch as society is but an aggregation of members, and not a homogeneous entity, *per se*, so whatever acts for weal or woe on any of its members influences thereby the whole body politic.

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\* Read before the Chicago Dental Society, May 6, 1890.

Then on which side of this argument lies the truth; or does it exist, as is so often the case, on both sides? To the latter possibility I make my plea, for I am firmly of the opinion that in a certain combination and modification of the views will be found the most desirable solution of this vastly important problem.

Not to occupy more time than is necessary, I submit:

*First.* Is it not a self-evident fact, and one that needs no argument to elucidate, that an instructor that has been intimately associated with a student, in mind and personality, for from two to three years, is infinitely better fitted to judge of his qualifications upon a single chair than he, the instructor, has made a special study than a member of a State Board, who has never even seen the candidate before, and that probably attempts to examine him on several chairs, none of which he, the member of said board, has made a special study? Before such boards a very well-qualified student might, through embarrassment alone, become so confused in his ideas as to be totally incapacitated from giving an intelligent answer while some self-confident egotist, though of very inferior attainments, might as easily slip through.

No two lecturers handle the same subject alike or "quiz" in the same manner, use the same language and definitions, or lay the same stress on the different points, and yet a bright student might learn as much from one as from the other, *but the same individual that teaches should "quiz,"* for a man accustomed to constantly quizzing classes will get much more intelligent information out of a class than the stranger that is but slightly familiar with quizzing.

I have repeatedly heard strange professors from other colleges ask classes questions which they totally failed to answer and yet, when asked precisely the same question by their own professor and in terms with which they were familiar, they would shout the answer at once in unison.

*Secondly.* If a so-called "professor," a man that makes the subject of his chair the leading work of his life, *is not competent to examine his students,* to decide whether or no a student retains the knowledge he has sought to impart to him, he certainly *cannot be competent to teach.* And it logically follows that if a State Board is to *examine the student* it should also *examine the teacher.*

*Thirdly.* *What precedent have we* for bestowing such authority on State Boards? Do State Boards pass on candidates for the degrees of A. M., M. A., D. D., or even Sc. D., Ph. D., C. E. and

M. E.? Yet these are the men that construct the lines of railway over which we travel, the great ships that carry us across the seas, our temples, towers and even the houses in which we dwell. Surely public safety is in greater jeopardy in their hands than in those of the members of the dental profession, and the latter are as easily amenable to the law?

*Fourthly. A college has a reputation to gain from its alumni.* The work the college does, the material it turns out, is its enduring record for good or ill before the world. They are a proof of the institution's right of existence and an index of what may be expected of it in the time to come. True, unscrupulous charlatans to-day, particularly in America, form so-called "colleges" for the sole purpose of self-emolument and pecuniary gain, but reputable men, those generally recognized as such by the profession throughout the land, realize that their work will be judged more closely and severely year by year and therefore, for their own personal good as well as that of the college, they will ever take pride in making sure that the goods they have branded and warranted shall never fall below just what they represent them, viz.: fit to practice their profession with credit to it, to their alma mater and to themselves.

*Per contra.* Why should a State Board, with its political insecurity in tenure of authority, seek to build up a reputation for its successors in office to enjoy—or destroy?

Within the walls of certain scientific and literary institutions the names of Elliott, Porter and McCosh are bright and luminous indeed, but outside those narrow limits we find the names of Harvard, Yale and Princeton far outshine the name of man or men.

*Fifthly. Who should examine the State Board* to ascertain if they truly possess the requisite superior attainments and endowments to the "college professor?" Moreover, should there be no power above this court of oyer and terminer; or should its decisions, evolved in secret session that may easily remind us of certain "star-chamber" proceedings, be final and irrevocable, the justice of whose awards no man may question? Manifestly such autocratic powers are dangerous in the extreme and but open a gateway for all sorts of bribery, chicanery and dishonesty. For who is foolish enough to suppose the members of this board would forget that there was but one entrance to the elysian fields they guarded, and that they were both the keeper and the king.



*Sixthly.* Has any one the temerity to claim that such rights vested in a State Board would *favor the general cause of education* and educational institutions, no matter how exalted the character of the institution might be? Most assuredly not; for I believe every candid man will admit that our State Boards are doing an injustice to-day to every college graduate, to his well spent time and money, in admitting men to practice dentistry on State examinations and licenses.

Finally, supposing it possible that a board should possess qualifications as examiners equally as good as the college faculties are they, the board, not still compelled to appeal to the faculty to ascertain as to the student's preliminary qualifications and the possession of his certificates of study and character previous to the time of his entering college, not to mention such incidentals as the length of time he has attended college, the amount and character of the practical operative and prosthetic, anatomical, chemical and histological work he has done, etc., etc.

But it is not necessary for me to present more of this negative side of the argument. I do not wish to elaborate; indeed, the subject needs no elaboration. My wish is simply to present some thoughts for your consideration, and to do so in as brief and concise a manner as possible. A word, then, as to the positive side.

*Where and how could a State Board be of benefit to the profession?*

I reply, when placed where it should always be—at the entrance to the college. Not, pardon me, a State board of Dental Examiners, but the *State board of education*.

Much is being constantly said about raising the status of the dental profession,

Only a short time since in conversation with a prominent member of the profession he replied, in answer to an interrogation put by me, substantially as follows: "No; my boys shall never be dentists. The opportunity for advancement is so limited on account of the narrowness of the field that my boys shall never enter it with my consent. I have reached the top round to which any one may climb; my time is all occupied, and I get as large fees as any one. If I were content to go no further, to be satisfied with a good income but with no field before me in which I might continue to work and grow, the dental profession might continue to environ my life work; but, being otherwise constituted, I have about decided to leave the profession to enter new and broader fields."

To one whose feet stood but upon the threshold of a newly adopted profession such remarks, from such a source, were not encouraging. But beneath the questionable advisability of such an expression of opinion I discovered, for the first time, the homely and unattractive truth. The field was narrow where it should be broad, and limited where it should be infinitely vast ; but the fault lay not in the profession, but in the minds within its fold.

*They* should be made broader and nobler and more liberal ; the status of the *average* professional mind should be raised, and I again submit that to succeed in this we must *begin at the foundation*, and not at the roof.

We all remember the homely but expressive old English adage, "You can't make a silk purse out of a sow's ear," and some will recall its simile in the Persian proverb, "Though you hang a wreath of sweet grasses about a pig's neck he will still go and wallow in the mire." I think both are pregnant with meaning to every member of the profession that sincerely seeks its elevation.

Let our States pass laws that only those shall be allowed to enter a Dental (or Medical ? ) College who can show from the State board of education a certificate of "*having passed the regular examination in our common schools for admission to the high school,*" and let the bill state that "*after five years from the date of the passage of this bill the requirement shall be, having passed the final examination in the high school,*" and let the candidate enter the Dental (or Medical ? ) College *as he would any literary college in our land.*

For should not this be made a "learned profession," and should a "learned profession" require a lower standard of preparation than a civil ?

Perhaps such a glorious day may be some distance off, but why should we not do all in our power to draw it nearer until at least some of us shall see it dawn ?

Then, how great would be the saving in both time and money to the student himself if such pre-requisites to entrance were needed ? Instead of being a green farm hand or grocer's clerk, that scarce knows what a school looks like, he will come equipped with *a student's mind and habits* and rarely should he fail to attain his degree ; whereas now he devotes several years of time and considerable means to the attempt, only to find it all lost in final failure.

The good that would necessarily inure to the benefit of the profession at large by admitting only such trained students goes with-

out saying. Do you imagine the profession would be so overcrowded as now, or do you think such students would patronize anything but the very best Dental Colleges any more than they now do literary? The great army of shysters and quacks would die from want of proper pabulum, and our profession would receive *only such men as would be a credit to it.*

There are unquestionably vast numbers of men legally practicing dentistry to-day that could not pass even the farcical examination of our civil service. It is *a credit to those men* that, without even the most elementary school education, they attained the license to practice, but *the fact* is a most flagrant disgrace and noisome reproach to a body of men that proudly assume the dignity and implied learning of a "profession."

Dentistry has made great strides to the fore during the last few years and with judicious guidance will undoubtedly become, what some enthusiastic members think she already is, an educated profession. But she is what she is not by virtue of her lack of even a primary school education, but *in despite of the lack of it.* Let us make it a profession in *fact* as well as in name.

Dentistry is like a beautiful and perfectly appointed yacht, trying to sail a race while handicapped by a crowd of lubbers on board that not only scarce know the difference twixt a "Marlin spike" and a "belaying pin," but who are ever obstructing the operations of the working crew. We cannot now well get rid of this worse-than-useless load but we can prevent more being added. So, when the present load is landed on Canaan's happy shore, we may "bout ship" to a freshening breeze and beat the professional fleet out in the race for the world's emblem of advancement.

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#### DOCTORATE ADDRESS.\*

BY A. W. HARLAN, M. D., D. D. S., CHICAGO, ILL.

##### INTRODUCTORY.

As every book that is worth reading, save the Bible, must have a preface, I desire to sound this note before presenting to you my formal—not formidable—address.

Yesterday, aye, even this morning we considered you as infants. Now since your diplomas have been given to you, you are men—are of us in fact. It was only a few years ago that this college was

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\* Delivered at the Eighth Annual Commencement, Tuesday, March 25, 1890.



founded, and to-day we present to the world the seventh graduating class. As the proud mother gazed upon her first-born, she predicted a glorious future for her child. If it chanced to be a maiden she thought of marriage for her offspring, happy wedded life as her own had been and would continue to the end. If a son, she hoped he would become a soldier, a statesman, or make himself famous in some other walk of life. This college has the same feeling for her children. She is not less solicitous for their future welfare, and as the sponsors for their professional existence her faculty one and all pictures a future for them that may be not without trials and struggles, but will be filled with an abundant and well-deserved success.

MR. PRESIDENT, MEMBERS OF THE FACULTY, GENTLEMEN OF THE GRADUATING CLASS, LADIES AND GENTLEMEN: It becomes the privilege of some member of the faculty annually to deliver an address at the close of each session of the college. Another gentleman was appointed to perform this pleasant duty to-day, but finding it impossible to appear before you as a spokesman of the faculty, I have consented to fill this brief half-hour in his stead.

You must remember that I appear before you as a substitute, and consequently what I may say cannot be considered, strictly speaking, the utterances of the one who stands before you, but of the one who should have spoken.

I feel the difficulty of the task of speaking for another, but nothing should make me shrink from duty so pleasantly imposed, because from a long and intimate acquaintance with him, I have learned his views with reference to what should be the subject of the closing address of a teacher to his pupils. In my last conversation with the gentleman he tried to impress upon me this thought, that it was my duty as his representative, to glorify the dental profession. The dental profession! That is a new profession in one sense, and in another it is almost as ancient as its alleged parent, the medical profession; because it is said that in the Alexandrian Library, which was destroyed many centuries ago, the records of all the operations of the early days were consumed, and our present knowledge of the antiquity of the profession rests on myths and scraps gathered from essays and writings on other subjects, where incidental mention only was made of the practice of the art and science of dental surgery.

We have been told during the past few years, that in exhuming the remains of some of the ancient Etruscans and Etrurians, that

specimens of artificial teeth had been discovered which must have been fabricated as early as three thousand years ago. This would demonstrate if it be true, that the art of the mechanical dentist was practiced, and with no little degree of skill, at that remote date. Gold, which as you know is the noblest of all metals, served as a base for these imperishable dentures.

Among the first written records that we can refer to, attesting any degree of antiquity for the dental profession will be found somewhere between the 15th and 16th centuries; but as a matter of fact, and throwing away all reference to these musty records of the past, the dental profession, the modern dental profession, the art and science of dental surgery as it is now known, dates from a period little less remote than the span of one lifetime, because the first attempt on the part of the practitioners of dental surgery to organize a profession into dental societies, or to establish a dental college and dental journals does not date farther back than 1838. It is true that a few lectures on dental surgery had been delivered here and there, notably by Thomas Bell and John Hunter, in England; Horace H. Hayden, Edward Hudson and others in the the United States; but the date which I have mentioned was the starting-point of this new profession which I am to glorify. Dental schools, dental journals, and dental societies from that period flourished at first with exceeding slowness. There were few dental societies, especially in the United States, prior to 1860, and fewer dental schools. But since 1860 there has been a very great increase in the number of dental societies, and dental colleges have multiplied with such rapidity that there are now about thirty well equipped dental colleges, and nearly 150 dental societies. Nearly every State and Territory in the United States, and many foreign countries have enacted laws regulating the practice of dentistry. This would seem to indicate that the dental profession was really a profession independent of its alleged parent. No one denies that the practice of dentistry, its intelligent practice, the practice of dental and oral surgery is a part of the healing art; but the average operations of the dentist from day to day would indicate that the practice of his profession rests in a measure on handicraft. It is also true that the surgeon must be a skillful craftsman, so that you might say that the art of a surgeon was mechanical, and in the same sense you may say the practice of the ophthalmologist, the otologist and gynecologist all require of the successful practitioner

a manual dexterity and a skill in the handling of instruments. He must familiarize himself with the use of instruments; a knowledge of mechanics is essential for him to perform the multitudinous and delicate operations that from day to day he is called upon to make.

The dental profession is not made up of doctors of medicine. We believe that there are 18,000 dentists in the United States, and of the whole number perhaps not more than 300 or 400 have received the degree of doctor of medicine, and still there are some enthusiastic gentlemen in the profession who say that because there are three or four hundred persons possessing the degree of doctor of medicine, that dentistry is a specialty of medicine. Now, I am as firm a believer in the acquisition of knowledge and in the broadness of a professional man's culture and studies as any one can possibly be, but I do not believe, I cannot think, that this intelligent audience, and that you young gentlemen who are just about to enter our ranks, believe that dentistry is a specialty of medicine because three or four hundred members of the profession have received the degree of doctor of medicine, many of them being entitled *honoris causa*.

As I remarked in the beginning, I am the spokesman of another, and by the preceding remarks you must not understand that I mean to belittle the medical profession. Far from it! I am one of its strongest supporters. I have faith in its benevolence, a respect for its learning, and am familiar with the achievements of its brightest lights and most brilliant ornaments, but I do not for one moment believe that it is probable, for many centuries to come, that all dentists will be doctors of medicine, and that the one title M. D. will cover all special departments of the healing art.

I beg of you to recall for a moment that the early ecclesiast was not only a priest, but a teacher; that the builder was at the same time an architect, and the surgeon was originally a barber; but to-day things have changed. The architect, the surgeon, the priest and the teacher have become separated from their dual occupations, and the result is that all their vocations are not only respectable, but are recognized and supported by an intelligent people throughout the civilized world. The evolution of the dentist and the dental surgeon was slow, but there was need for such a profession and the man stood ready to fill the existing need. The early dentist endured the ridicule and sneers of those who felt not the necessity for his existence, but manfully he went on in the pur-



suit of knowledge and the acquirement of skill until he was a recognized force, a necessary part of the community. He did this unaided at first, but finally, men renowned in medicine and surgery forsook the practice of medicine and joined the dental ranks. This was beneficial to both; the surgeon exchanged his knowledge of medicine and surgery for the special knowledge of the dentist in treating, filling and making artificial teeth. To this day examples are not wanting of this method of exchanging knowledge. We find physicians practicing dentistry, but very seldom do we find a dentist taking up the practice of medicine; indeed, it is impossible, as the laws of the land forbid it. The doctor may practice dentistry after one year's study, but the dentist, the doctor of dental surgery, must attend two courses of lectures at nearly all of the medical colleges in addition to having the usual hospital practice before he can exercise the art of medicine and surgery. There seems to be something wrong here, but it is not my duty to dwell on this phase of medical and dental education.

I stand before you to-day with the injunction ringing in my ears that I am to glorify the dental profession. The one for whom I speak knew that I was one of the most enthusiastic practitioners of dentistry that could possibly appear before you. I believe in its future; I believe in its beneficence; I believe that Americans, and in fact the people of all countries, could ill spare the dentist or the practitioners of dentistry from their midst. To-day there is no disease or abnormality of the mouth, teeth or jaws that does not respond to the touch of the skillful practitioner of dental surgery. The dentist of to-day, unlike his predecessor dating before 1840, has a very accurate knowledge of chemistry, anatomy, physiology, surgery, materia medica, therapeutics, and in the practice of dentistry both operative and prosthetic. In this respect his knowledge of these subjects is not inferior to that of any doctor of medicine; but because he does not possess a doctor's degree M. D. he cannot claim for himself that he is a true specialist in medicine, because all specialists in medicine must first be doctors of medicine and afterward choose a specialty which has attracted them to its practice, on account of their love for that particular branch of medicine.

In the case of the dentist he deliberately chooses at the outset that he will be a dentist, and he discards from his mind the thought that he will be a doctor of medicine, because it is his intention in the beginning to practice the art of dental surgery. He

does not desire a comprehensive knowledge of obstetrics, or nervous and mental diseases, or medical jurisprudence, or of the general practice of medicine, or any other (to him) useless portion of the curriculum of a medical college; but when he departs from the fundamental branches that I have previously mentioned he takes up the study and practice of operative dentistry, and the practice of prosthetic dentistry, which covers nearly the whole field of his future usefulness.

The dentist, on account of his occupation from day to day requiring him to be in-doors, can shorten his hours. He can devote time to study, to experimentation, and to recreation. He can take up any branch of science and pursue it without injury to his clients, because, having his hours fixed as the clock strikes, he can drop everything and go. It is in consequence of this freedom from having to come and go at the beck and call of every one who fancies himself ill that the dentist of the future will be able to make still further scientific research.

We need only point to such men as Sir John Tomes, Richard Owen, Magitot, Arkovy, Garretson, Black, Miller, and other living scientists, practitioners of dentistry, to see what the dentist of the future may do. Having time at his command, he may select any subject connected with the theory or practice of dentistry and make that subject his own. There are many fields that have as yet been unexplored. In addition to the strictly experimental work of the future dentist, I would urge young men to fit themselves as teachers and writers, both of which fields are sparsely filled. Colleges go on at this present moment, no matter what changes take place in faculties from year to year. This will ever be true. It has been well said that an editor never dies—the work goes on midst countless changes which are rung by the hand of time.

The ability to teach, when conjoined to the art of imparting knowledge in a captivating and at the same time impressive manner, should be cultivated by all who essay the direction of the future dentist. In this department of educational work some of you may shine in such a manner as will not only reflect honor on yourselves, but will likewise dignify your chosen lifework. To write well is something which you need not be ashamed of, as were some of the ancient scribblers! If, in the beginning, your work is not brilliant, you should remember that some of the greatest authors

of the past and present labored hard to perfect their style. The writer on scientific subjects must be exact; he should have access to all authorities; he should not count the time or research as lost, if he presents a resumé of the work of others. To condense and at the same moment do justice to the reasonings of others, pointing out false deductions, and connecting the chains of thought into a consecutive continuous whole, was the work of a Gibbon, a Hume, a Macaulay and a Bancroft. The writer is ever a student, and I commend you to the masters of literature, scientific, biographical, and historical, for models on which to build your future works.

At this moment, in the presence of this multitude, gathered to witness your entrance into professional life, I bid you a hearty welcome. No longer will you be compelled to listen to the familiar tones of your teachers from the rostrum—from this day your professional brethren. No longer will the dreaded quiz confront you, as it has done these many happy months in the past; but you are free from the yoke of pupils, free to become independent thinkers, experimenters, teachers, editors and successful dentists. May I venture to hope that you have selected your ideal, and that you will not rest or grow weary in your struggle to attain it. That you will succeed in every venture undertaken to elevate and dignify the profession of your choice, is the ardent wish of every member of the Faculty of the Chicago College of Dental Surgery.

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#### DENTISTRY IN JAPAN.\*

BY ATSUSHIKO KATAYAMA, D. D. S., YOKOHAMA, JAPAN.

Before I describe dentistry in Japan, a brief sketch of the medical science of Japan is necessary.

Our ancient medical science was almost similar to that of China, but since the Hollanders opened a trade between Holland and Nagasaki (southern part of Japan), somewhere about two hundred years ago, the Dutch Medical Science has prevailed and made great progress. And again, since the first treaty between the United States and Japan was concluded by Commodore Perry in 1854, England, Germany, Russia, and other countries following suit, our medical science has made a sudden and successful progress. Not-

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\*Thesis for the degree of Doctor of Dental Surgery, Ohio College of Dental Surgery, 1890.



withstanding, our Dental Science was very poor and scarcely practiced till 1873, yet as soon as Medical Science established her successful position, Dentistry began to follow. In 1873, our Government created a "Dental Board of Examiners," that examines twice yearly.

Since the law is formed in this manner, this Department has made a progress similar to the Medical Science. One of our ancestors in Dentistry was a famous professor of fencing, about five hundred years ago. He himself often felt very inconveniently the lack of a Dental Science. Frequently, while he was teaching, accidents would occur in which teeth were broken or loosened. Whenever an accident occurred to a person's teeth, the professor operated on them. For instance, if the crown were broken, he made a tooth with a piece of wood or wax temporarily; if it were a loosened tooth, he extracted it with his thumb; if a case of hæmorrhage, he stopped the bleeding by pressing his finger on the place until it ceased. At length, he succeeded in making artificial teeth, also in the extraction of teeth and the stoppage of hæmorrhage. Thence he called himself a dentist. Since he became a regular dentist, there have been many original native dentists practicing dentistry until the present time.

Their methods of practicing were entirely different, in every respect, from those who are practicing in civilized countries at the present time. They never filled cavities in teeth nor treated the teeth. They only knew how to extract the teeth and to make artificial plates. When they had a patient who had a bad toothache, they either lanced the gum or put a pellet of cotton saturated with oil of cloves or essence of peppermint into the cavity. If they could not relieve the pain they extracted the tooth, whether it could be saved or not.

Their general method of extracting, using full power, and placing a piece of paper on the tooth to resist the slipping.

This method succeeded almost every time, but sometimes when they met very difficult cases they used a hammer and a wooden stick, which they applied to the tooth and then knocked it out or in. However, this was very seldom done. They had a very peculiar method of extracting the deciduous teeth—so peculiar that we have never understood it. The child was given a piece of paper, which it was told to bite or hold firmly with the tooth that was to be extracted. The dentist, standing at a small distance from the

child, would ask, "Are you ready?" and when the answer "Yes" came, he would clap his hands and go to the child and let him open his mouth; then the tooth would drop on the floor with the paper. Nobody has ever ascertained what was used on the paper, but some suppose that they put a very adhesive wax on the paper, or, according to others, a piece of sticky candy was used, because some of the children said the paper tasted sweet. We claim that it must have been a piece of extra adhesive wax, though it is uncertain. The method of making artificial plates was almost the same as that used in civilized countries to-day. They had neither metal nor rubber plates; only fine wooden plates were in use, and they had no porcelain artificial teeth.

They first took impressions with beeswax (without impression tray), and after it had hardened enough to handle, hard wax, or a kind of plaster of Paris, was pounded into the beeswax impression for a model. After getting this model, it was generally painted with some coloring matter, especially red. A carved imitation of the model was then produced (cherry-wood being considered the best wood) which was put over the painted model; the paint marked the protruding parts. It was then carved again and again, until the paint marked the whole inside of the wood carving. After this was finished, they were ready to set ivory, wood, bone or marble teeth in the carved wood. Holes were carved on the margin of the wooden plate in which the teeth were set. They did not set more than eight teeth, that is, from the central incisors to the bicuspid, silver or gold pins taking the place of the molars.

The teeth were retained in their place by small, strong threads. In a case of "partials" they never made a plate, something like bridge-work was used, tightening it in the mouth by the neighboring teeth or staying it by gold or silver clasps. They made two kinds of plates—white-teeth plate and black-teeth plate, the former being for men and unmarried women; the latter was for married women only. It will not be out of place here to tell *why* our Japanese women blackened their teeth after marriage and *how* it was done. The substance with which the teeth are blackened is a solution made by dissolving a piece of iron in an acid. When they apply it to their teeth the substance is first rubbed on with a brush, then a little powdered tannic acid is applied with a brush, and this is repeated until the teeth are thoroughly black.

As we dentists know, the enamel of human teeth is very hard and smooth, so that it cannot retain any coloring matter on it long ; consequently, if a woman has well-developed enamel, it is almost impossible for her to keep her teeth black, but on the contrary, badly-developed enamel retains the coloring matter for several days. The coloring matter adhering to the enamel is entirely dependent upon the good or bad development of the enamel ; therefore, if a woman has well-developed enamel, she uses a diluted solution of acetic or sulphuric acid, which she applies with a brush. This she does first to roughen the surface, after which she proceeds to blacken her teeth ; these operations are repeated until she succeeds.

We do not know exactly when the custom of blackening the teeth began, but we can suppose it had its origin in the sixteenth or seventeenth century, when the country was so much disturbed by her civil wars. At that time many of the feudal chiefs of the Emperor were scattered around the country living in obscurity or privacy, and as they were known to be both brave and patriotic, a feeling of dislike crept into the people's hearts against the inactive and *unsoldierly* literary men. The military art was exalted and flourished vigorously. The women, reflecting the men's opinions, selected the brave military men for husbands instead of the sedate literary men.

If once married, though the husband immediately lost his life on the battle-field, the bereaved wife never married again, and this should be remembered to the honor of our women's lives. Then began the practice of blackening the teeth after marriage ; this was the sign that the wife's virtue was sacred to her husband, and also the oath that no future marriage would ever take place.

The reason given for blackening the teeth is quite poetical ; it appears that teeth once blackened never resume their natural color, and that women once married are never unmarried.

This custom is almost entirely unseen at the present time, except among old women. Our Japanese married woman's custom was bad, but it appears to me that the cramped foot of the Chinese woman and the compressed waist of the European woman is fully as bad and much worse for the general health. As custom becomes "second nature" all over the world, civilized or uncivilized, our country has distinguished herself by the most complete and rapid revolution of old customs and the adoption of European civiliza-



tion. No country in the range of history, excepting our own, has in the short space of twenty-five years made such a complete change in *public sentiment, habits and government* without bloodshed.

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#### CARBOLIC ACID.\*

By O. E. SEEGLITZ, D. D. S., Chicago, Ill.

In preparing a paper on this subject, your essayist finds himself confronted by an article which is old and the correct medical properties and action still new to many of our profession.

Reviewing the numerous papers which are recorded in text books, and quotations of debates to be found in our journals, it is apparent that this drug has had a good deal of consideration by the leading members of our profession, and will therefore leave very little, if any, new matter for me to add.

Nevertheless it might be of importance and for further completeness of the subject, to repeat these assertions of former investigators.

Carbolic acid, phenic acid, phenylic alcohol, phenol, are the various names in use to specify a white crystalline substance of a smoky odor, with a formula of  $C_6H_5HO$ .

The universal but inappropriate name, carbolic acid, is misleading, conveying the idea that it belongs to the acid series, it being neutral in reaction. It is really an alcohol produced by fractional distillation from the heavy coal tar oils which distill over between  $338^{\circ}$  and  $365^{\circ}$  F., and are then purified by repeated crystallization.

It is said to be, by weight, composed of 72 parts carbon, 6 of hydrogen and 16 of oxygen, which would render its molecular weight 94. It crystallizes at  $70^{\circ}$  F. and melts at about  $95^{\circ}$  F.

It is freely soluble in alcohol, ether, chloroform, glycerine and the essential oils; a mechanical mixture may be made in all proportions in water, the acid being cut up into small globules which will after a while settle at the bottom of the vessel, it being soluble only in 5 per cent acid to about 20 of water, or add 5 per cent of water to 95 per cent of acid crystals and it will be converted into a liquid.

The red color which the crystals or solutions assume when exposed are thought to be caused by the presence of ammonia in the

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\* Read before the Chicago Dental Society, March, 1890.

air affecting the acid, which, being prepared in copper retorts, is impregnated with a quantity of copper.

This discoloration of phenol has a tendency to give it the color of creosote, a production similar to it, the distinction being that phenol will separate nitro-cellulose from its solution in collodion.

Phenol being produced in different qualities, it is important that for dental operations the very best should be procured.

The medical properties and actions of phenol are in its pure state escharotic, and in solution anæsthetic. It is a powerful coagulator of albumen and therefore self-limiting in action. Applied to living tissue it causes a burning sensation, and produces a white eschar. This is due to the coagulation of albumen in the tissues, which subsequently turns dark. I might here state that phenol being a coagulator of albumen, it should be kept out of all pulpless teeth. This is especially necessary in the anterior teeth, it causing a marked discoloration by coagulating the albuminous substance of the dentinal tubuli and thereby retarding the actions of the various bleaching agents, and I do believe, in cases where a tooth after being bleached assumes this discoloration, it is partly due to this coagulum in the dentinal tubules.

Phenol being extensively used by the medical as well as the dental practitioner, it may be well to consider it from that point; being used internally in small doses—about  $\frac{1}{4}$  grain—for the relief of nausea and vomiting. It has been used in diphtheria, scarlet fever and typhoid fever; it is used locally for catarrh, and the inhalations of its vapors are beneficial in asthma and chronic pulmonary affections.

In long-continued applications of strong solutions of phenol, care must be taken, as its destructive influence will involve all the adjacent tissues. When swallowed in sufficient strength and volume it becomes a violent gastro-intestinal irritant, and is fatal by producing paralysis of the spinal cord, the medulla, and the respiratory and vasomotor centers.

Antidotes to its poisonous effects are lime, magnesium sulphate or sodium sulphate, and oils.

Phenol forms with other substances many valuable preparations, such as pheno-resorcin, phenol-sodique, campho-phenique, and various mixtures of or preparations may be made at will with phenol and the essential oils, many of which are very useful, especially as a dressing in teeth and abscesses.

## STORAGE BATTERIES.\*

BY DR. R. M. SANGER, ORANGE, NEW JERSEY.

Electricity has now become available for so many purposes in dental practice that a spirit of inquiry is being stirred up as to the best methods of generating and dispensing it. In cities and towns that are supplied with an electrical plant for lighting lamps and furnishing a strong current for motors, one would suppose that no difficulty would be met in procuring and using as much electricity as could be desired. Unfortunately the office use of electricity is not by any means as simple as it would seem to be under such circumstances. The problem is apparently a simple one, and stated in this way; given a high current, requires this answer—use as much of it as you may need. In fact, however, it is not so simple. One difficulty is that the dynamos are not run at all during the day, and this is the time when the current is needed by the dentist. In a few large cities this does not hold good, but these are the exception. But even in such places where a day current is available, the reduction of the current to the desired voltage is not by any means easy, as the complicated, not to say expensive apparatus offered for sale indicates. The majority of dentists are probably shut off entirely from high currents and to them the question of procuring a satisfactory supply of electricity is important. Living as I do in a town where there is no electrical plant, I have spent much time in investigations looking to a solution of this question. The results of my experience are now given in the hope that some one situated as I have been may find relief.

One conclusion which I have reached is that primary batteries must be abandoned as a satisfactory source of supplying electricity for office use. It would be impossible after my experience, to convert me from this opinion. In these batteries the destruction of one of the elements, the rapid decline in the strength of the current, the task of frequently changing the acid solution (troublesome, and destructive to clothing as it is), all these combine to make them far from being things of beauty and a joy forever. The action of a primary battery when first set up, with its rapidly acting current, charms the heart of the tyro in the use of electricity. But a few weeks only will have passed when the lessening current, the corrosion of the mountings, and the deterioration of the fluid causes a

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\* Read before the Brooklyn Dental Society, March 24, 1890.



doubt of its utility, which rapidly develops into a feeling of resentment against the inanimate thing. At least, this is my own experience, and for me the primary battery is a thing of the past, where large and strong currents are needed.

It is not my intention at this time to describe the construction of storage batteries and the principles upon which they are founded. Others have lately done this in a manner that leaves nothing to be said, and I take it for granted that you are familiar with this subject. Neither is it my intention to discuss the relative merits of different "makes" of batteries, for the excellence of one make of plates has forced others either to reach the same standard or withdraw from competition. The plates I have always used are those made by Mr. Carter, and it is only right that I should say, that these plates have given perfect satisfaction, while the gentleman has not been slow to make improvements where it was possible to do so.

My idea at this time is more especially to call your attention to the slight amount of care required to keep a storage battery in working order. Taking it for granted that the plates are properly and securely separated from each other, and that the mountings, where brass is needed, are placed beyond the reach of the fumes of the solution (as they should be) the only care that the battery needs is in supplying the loss of water by evaporation, which can be done by simply pouring in the necessary amount without disturbing the plates to do so. The explanation of the simple care required to keep these batteries in order is the fact that a current is not generated, but simply stored in them. The chemical action taking place in this accumulation does, of course, result in some loss of material in the plates, but the deterioration is so slight that several years will pass before it can be seen in a diminution of the current.

The electromotive force given by each storage cell is practically the same, whether the plates used are large or small, being about two volts to a cell. The number of amperes given by a cell depends on the amount of surface in each plate, and the number of plates. This arrangement gives certainty, with ease in doing the work needed. For one purpose large voltage is required, while for another much less is needed, and, by a simple switch board, as many cells as may be necessary can be brought into the circuit. All uneasiness in regard to currents of unpleasant strength is in this way avoided, as the highest voltage ever wanted is far below

a dangerous or unpleasant degree. In using an incandescent current of 110 volts, there is a possibility of some time getting that strength, but in a series of storage cells giving as a maximum 8 or 10 volts, nothing in excess of this is possible.

The various objections urged against storage cells have been fairly tested, and I have only this to say—that, given a good set of plates, properly set up and looked after with ordinary care, there need be no complaints or objections made. There are some men who can keep a primary battery in better shape than others can, and there are some men who would never keep anything in order. It is the latter, I think, who have made so many objections to storage batteries. It would be dangerous to trust such men with the current of a dynamo. They would probably be victims for the coroner, through failure to give attention to their apparatus.

In places where a current from a dynamo is not available, there is no question in my mind as to the usefulness of the storage cell. The charging can then be done by gravity cells of the pattern used in telegraph offices, or still more satisfactorily by a caustic soda battery recently invented by Mr. Laland and perfected by Thomas A. Edison, for use in connection with his phonograph.

The number required will depend upon the size of the storage cell used. The objection to this mode of charging the storage that after all we are at the mercy of a primary battery, is not well founded. We do not depend entirely on these gravities. They simply do the charging, and when the secondary plates have received their charge, the gravities may be taken apart, cleaned and renewed, without hindering, for a moment, our use of the electricity already stored in the secondary plates. The gravity cell, moreover, being of slow action, is not exhausted for a long time, and then only slowly, so that plenty of notice may be had of a need of more sulphate of copper or new zincs.

In places where a dynamo current is available during the night, but not during the day, the use of the storage cell is made very easy. It is then a simple matter to get from the current during the night a charging that would do all the work possibly required for several days. The reduction of the high current to the capacity of the storage is done by means of a resistance box, and when the proper amount of resistance has been once interposed it needs no attention. If it is considered an objection to have this resistance box the cells could easily be taken to a dynamo and charged over

night. If the storage is of sufficient capacity this need not be done oftener than once in two weeks, or even once in a month.

Now what shall be said of places where a day current from dynamos is available? We are told that under these circumstances batteries of any kind are useless; that the current can be received and reduced as may be necessary, with the aid of very little apparatus and no trouble. It is said also that danger is an unknown quantity. It should be said in reply to these statements, that the apparatus for reducing the current is by no means as simple as might be supposed. There are two difficulties in the way:

*First.* The resistance is between the high current and the patient, and a failure of the resistance would be likely to have an unfavorable effect upon the nerves of the latter.

*Second.* If lamps are used in the current to make the necessary *réduction* the operator may find himself suddenly shut off from his supply of electricity. Lamps are by no means unbreakable, and they may cause much annoyance. By using the storage cells the possibility of getting a higher current than the cells give is impossible, and if the resistance fails an overcharging of the plates cannot do harm to any one.

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## PROCEEDINGS OF SOCIETIES.

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### CHICAGO DENTAL SOCIETY.

Regular monthly meeting March 4, 1890. The president, Dr. P. J. Kester, in the chair.

DR. O. E. SEEGLITZ read a paper on "Carbolic Acid."\*

DR. A. W. HARLAN, who was called upon to open the discussion, said: Mr. President—As the essayist remarked, this is a threadbare subject, and still there are many things connected with the use of carbolic acid that do not seem to be well understood. I had not intended to say anything, but will say that we have crude carbolic acid, pure carbolic acid, and synthetic carbolic acid, the latter rather a new product, a specimen of which I have, but failed to bring here with me. It is almost snow white, and the crystallization is so complete and its melting point so much higher than that of distilled carbolic acid, that when you shake the bottle you can

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\* See page 320.



hear the crystals beating against the sides. On account of its greater purity it is more freely soluble in water than the product of Morson or Merck, or any of the American manufacturers whose products I am familiar with. It does not smell like anything else. It is almost odorless.

With reference to the uses of carbolic acid in dental surgery, I consider it a very valuable agent indeed, in a great many places. It is useful, as many of you know, in the opening of abscesses in a 95 per cent solution. If you dry the mucous membrane and dip the point of the knife into carbolic acid and draw it over the surface, pretty soon you reach the pus and will have produced almost complete anæsthesia while doing it. Of course this is not new to any of you, but for fear that some of you may have forgotten it I simply mention it. This is useful in the cases of nervous, fretful people, and with children. Carbolic acid is a very valuable obtundent of sensitive dentine. One of the reasons why it is an unfit agent to be used in pulpless teeth is that its odor will always disguise any odor that might be present in the tooth, so that you are unable to tell when you completely disinfect the dentine. For instance, if you open into a pulpless tooth and within five or ten minutes after introduce a pellet of cotton soaked in carbolic acid or any other substance that has carbolic acid added to it so that its odor is not destroyed, when you remove the cotton you will be unable to tell whether the gaseous product has been entirely dissipated or only smothered. This is one point that is frequently overlooked.

The principal reason hinted at in the paper why carbolic acid should not be sealed in a pulpless tooth for any considerable period was on account of its coagulating properties, especially if the tooth was about to be bleached. A five per cent solution has the objection that its odor overcomes the one that proceeds from the tooth, and a 95 per cent solution has the same objection, and it has powerful coagulating properties. If you desire to bleach a tooth you will have to cut out the interior of the dentine that has been glazed in order to have the bleaching agent penetrate the parts. I think one of the reasons why a great many gentlemen have been unsuccessful in bleaching teeth is because they have used carbolic acid too copiously and have overlooked that point. If they had gone to work and made a new surface of dentine, the bleaching agents might have been used with greater facility.

Carbolic acid is not a true disinfectant, according to the investigations of the later workers in bacteriology ; it does not rank as high as a great many other substances. I, myself, prefer agents for disinfection that are odorless, if possible. Next, I prefer agents for disinfection, as you perhaps well know, that are freely diffusible, and on that account I think carbolic acid should take its proper place, that is, as a local anæsthetic and a sort of general disinfectant in places where more or less surface disinfection is required, for opening abscesses, and as an ingredient, if you please, of mouth-washes, sprays, inhalations and for the correction of nausea in medical practice, and as a parasiticide.

DR. GARRETT NEWKIRK: I hardly ever now introduce carbolic acid into a pulpless tooth, either for disinfection of the pulp canal or the dentine. I do not doubt the statement that it may be used with benefit in some cases, but I think we have agents that are better. I believe in the use of the essential oils, and particularly the oil of cassia, as demonstrated by the experiments of Dr. Black. Any of them it seems to me are better than carbolic acid, because in the first place, they are better disinfectants ; and in the second place, they are not coagulants. By the use of either the oil of cassia, gaultheria, or oil of cloves, (and I am using almost exclusively the oil of cassia), it seems to me I get the best results possible.

One disadvantage that has not been alluded to in the use of carbolic acid is that if you pass it to the end of the canal, and a little of it goes through, it is liable to act as an irritant and excite inflammation of the parts beyond. I have seen disagreeable effects from its use in that way.

I use carbolic acid to anæsthetize and whiten the gums, which have to be pushed back for the filling of labial cavities. It also prevents hæmorrhage. By drying the parts carefully and using the carbolic acid for a few moments we get not only its coagulating properties, but quite complete anæsthesia, which will last long enough to assist us very materially in the operation. I should say do not use it in close proximity to an exposed pulp.

DR. WILLIAM G. STOWELL: I desire to say a few words with reference to carbolic acid. It has been a friend of mine for a good many years. I believe the essayist said it should be kept out of pulpless teeth. If a pulpless tooth needs bleaching, and I am

troubled about getting the canal dry, as a coagulant it is better than anything else I can get in there.

Dr. Newkirk says he has seen inflammation follow the use of it beyond the apical foramen. That might be if any considerable amount was forced through, but I do not see why he does not use it for exposed pulps. It seems to me that it affords a better protection to the pulp than anything we can use.

DR. L. L. DAVIS. I use very little carbolic acid, except in combination with other medicaments. For treating children's teeth, I employ this formulæ :

℞ Carbolic Acid (crystals).....	3j
Oil of Cassia.....	3j
Glycerine.....	3j
Alcohol.....	3ij

which makes a more pleasant dressing than any of the essential oils or creosote. Children are not nauseated or afraid to return after its use, and it quickly relieves pain. I use the pure carbolic acid for obtunding sensitive dentine.

DR. A. E. BALDWIN: The subject is a very old one, and I do not propose to discuss but one feature of it, and that feature has been propounded by the essayist and nearly every one of those who have discussed it so far. I rise simply to propound this query: If the supposed anæsthetic properties of carbolic acid are not due to its coagulant rather than to its anæsthetic properties *per se*? I believe it is so. I believe it has no anæsthetic properties whatever, only in its effect upon albuminous tissue. That feature of it, I think, has been clearly demonstrated by articles that have been written, and many of us have had an opportunity to read them, but may not have done so. This anæsthetic property, however, is claimed by a great many men whom we would suppose would not make any claim without they felt sure of it. If you take any substance whatever which has the power of coagulating albuminous tissue that has been brought in contact with it, just as soon as it is brought into contact there will be proof of sensation on the superficial surface where the nerve fibers terminate. The moment these are coagulated, until nature has provided some new terminii the part will be said to be anæsthetized. The term anæsthetic, therefore, is used erroneously. It should be used as something that will render a part unconscious of contact with any object for the time being, without destruction or interference with its organic



structure. Of course it does not do that, and it is not proper for us to use that term.

DR. C. F. HARTT; Mr. President, carbolic acid has been spoken of this evening as being a good obtunder of sensitive dentine. While it may possess this property to a certain extent, it is also capable of producing severe pain..

While having some of my own teeth filled eight or ten years ago, the eminent gentleman who conducted the operation informed me that he considered carbolic acid a good obtundent for sensitive dentine. Not suspecting my danger, I asked him to try it. Its effect was to give me a severe toothache during the time the dentine was being rendered insensitive, and was by far the most painful part of the whole operation. It has been my experience with sensitive dentine obtunders, so-called, that they cause as much pain, and sometimes more, than they relieve.

DR. J. W. WASSALL: I would say, with regard to Dr. Hartt's remarks, that the pain produced by the application of carbolic acid into sensitive cavities is due in a great measure to shock from cold. This may be avoided by warming the pledget of cotton which has been saturated with the medicament in the flame of the spirit lamp.

I have but one point to add to what has already been said about carbolic acid. It is this: Some antiseptic should invariably be used in a cavity before it is filled. For living teeth I always use a 95 per cent solution of carbolic acid. It is certainly efficacious in destroying any microbes that may possibly be alive. No matter how thoroughly the excavation is done there may be some foreign substance, or microbe, remaining in the dentinal tubules, or at the margin, which needs disinfection before a filling is made. For teeth with living pulps I make it an invariable rule to wipe out the cavity when prepared, with carbolic acid. This is the chief use I make of the drug. An essential oil is employed for this purpose in pulpless teeth.

DR. EDMUND NOYES: There is one other use for carbolic acid that has not been mentioned here to-night, which I have been in the habit of making, and that is in extirpation of pulps which still retain some degree of sensation. Success depends chiefly upon the ability to carry a portion of the carbolic acid very nearly to the foramen. If the pulp is so little sensitive that a fine probe can be carried along the wall of the canal to the apex of the root with

slight pain, we may often succeed by repeated efforts in working down a little carbolic acid to that point, and in the course of a few minutes render the pulp anæsthetic, or else obtain its escharotic effect upon the tissue near the entrance into the root so that we may remove it with little or no pain.

The use of carbolic acid for wiping out cavities of decay previous to filling has been advocated by a great many and practiced by a large number of dentists for years and has been lately objected to on the ground of its escharotic effect. It seems to me that the truth in the case would lie in this wise: That if decayed dentine has been completely removed, so that we have a layer of practically sound tissue, that then the antiseptic effect of the carbolic acid will be sufficiently complete and the escharotic effect so very slight that the amount of tissue coagulated will be so small as not to be objectionable. But if any considerable thickness—I might almost say any appreciable thickness—of decayed material is remaining in any portion of the cavity, I do not think carbolic acid can be relied upon to render it antiseptic throughout its depth.

If we purposely leave anything of that kind in a cavity so as to avoid a pulp exposure, I think it should first be disinfected by one of the essential oils; after that, if it is thought the pulp will be better protected by coagulating the surface of the cavity next the filling, there is no objection to using 95 per cent carbolic acid; the contents of the cavity having been previously permeated by the diffusible material.

DR. T. L. GILMER: There is just one point I would like to refer to. Dr. Wassall spoke of the use of carbolic acid as a germicide in cavities previous to filling them. That is proper, but there is another use that I make of it, and I think he makes the same use of it without having spoken of it, and that is to coagulate the surface contents of the tubuli so that thermal changes will not affect the teeth as they would do if there were no coagulated material there. My experience has been that it is of great advantage used in that way. I believe that carbolic acid has a place in dentistry, and my experience with it in capping pulps leads me to believe that it is the very best agent we can use, that is, as a coagulant, as Dr. Stowell has said.

I have a tooth in my mouth whose pulp was exposed; it protruded from the opening in the pulp cavity. That part was excised, and it was treated with carbolic acid and filled as long as 17 or 18

years ago, and I know it is alive yet. I know from my own practice for the last 18 or 19 years, that in those teeth, the cavities of which I have been flooding with carbolic acid before making my cap, those are the pulps that have lived the best. But the principal point I wish to speak of, was the one that the teeth are not nearly so much affected by thermal changes if a certain portion of the contents of the tubuli is coagulated by the application of carbolic acid.

DR. HARLAN: Smith, of Edinburg, Scotland, made a number of experiments with reference to the anæsthetic properties of carbolic acid, and they were made on the arm. The skin was painted with 85 per cent solution of carbolic acid, which produced the usual eschar for some distance, perhaps half an inch or an inch from the point where the coagulated surface had been produced, for several hours afterward. He then introduced needles to the depth of half an inch—perhaps deeper, I do not remember the exact depth of all the punctures—and it was absolutely painless. After reading these experiments, which I only recalled in thinking on the subject as Dr. Baldwin spoke, I took the precaution to make two or three experiments of that kind myself, and I found that the anæsthetic property appeared to be communicated to the adjacent territory beyond the point where the carbolic acid had been painted, and that it lasted a number of hours. Other corroborative evidence may perhaps be recalled by gentlemen present who have injected carbolic acid into the roots of teeth by forcing it into an abscess with a fistulous outlet, and the patient would complain of absolute loss of sensation over the territory of half an inch or sometimes over the whole side of the face. Charles Tomes has reported a number of cases of this kind. I know in my practice there has occurred things of that kind, and in addition to the coagulating properties of carbolic acid it has anæsthetic properties, and it is unlike chloride of zinc. Chloride of zinc is an irritant escharotic. It abstracts water much more rapidly than carbolic acid on account of its greater affinity for water, and hence its irritant properties are felt deeper. Carbolic acid as you know abstracts water much less freely and its action is self-limited. There is no doubt about that. One of the reasons why I do not use it to wipe out a cavity is this: If there are any traces of decay remaining in the cavity, I cannot tell how deep they may go, and as carbolic acid is self-limiting, I am not sure that I would destroy all of the micro-



organisms or septic material that may be present, and consequently I use some diffusible substance, which is generally an oil, and if I want to prevent thermal shock, instead of using carbolic acid and producing a coagulum, I would paint the interior with copal ether varnish and not bring it out to the margin of the cavity, and you get a better protector than coagulated albumen, because that actually deposits a substance that contains no element of destruction of human tissue, and hence it is better on that account.

To all of those gentlemen who are in the habit of injecting abscesses with open fistulæ leading from the roots, say of the first or second molar, I would say they had better dilute the carbolic acid with an essential oil or alcohol instead of using a 95 per cent solution, as I have seen a number of cases where there was complete loss of the external plate or the inter-alveolar partitions on account of the injection of an immense quantity of carbolic acid. I know of a number of cases in which a portion of the alveolar process has been destroyed by the injudicious use of carbolic acid.

With reference to the use of carbolic acid in pulpless teeth, I have talked and thought about that a great deal. I have made numberless experiments with it. I have spent a great deal of money in purchasing specimens of carbolic acid from various manufacturers, and I feel, in consequence of that, I am entitled to say something about it with some degree of authority. I say carbolic acid is a coagulator of albumen, and that it frequently defeats the object of the dentist in very fine canals where there is a little weeping through the apex, and it prevents complete filling of the root, because it is impossible for the dentist to see at that point.

DR. BALDWIN: Before the subject is passed I want to say a few words with regard to what Dr. Harlan has said about carbolic acid being an anæsthetic. It strikes me that the conclusions are hastily drawn. It is a well-known physiological fact that there are many portions of the body, especially the thick muscular structures of the legs and arms, where a needle can be made to penetrate with almost entire painlessness, without any anæsthetic whatever. The *locality* in which the carbolic acid was used on the arm would either increase or decrease my opinion of its anæsthetic properties very greatly in the experiments that were made and referred to. If it is an anæsthetic it can only have an anæsthetic effect upon the tissues with which it is brought into contact, or tissues which are furnished with the same nerve supply. This subject has been writ-

ten upon by a great many authors, and it would be foolishness for us to expect to arrive at definite conclusions here to-night.

In regard to the destruction of bones of the jaw, referred to by Dr. Harlan, I think there is a question as to whether the carbolic acid was the cause or not. In those cases where the jaw-bone has died, it is an utter impossibility to tell, without a careful diagnosis of the case and of the remedies used, the condition of the patient previous to the application of the remedies, etc., as to the cause of death. I think we are apt to have preconceived ideas on this subject, and are too liable to accept conclusions from experiments, without having sufficient proof to be conclusive to those who are not in the line of investigation themselves. I think carbolic acid is a useful agent. No agent could have the recommendations and indorsements it has without it is useful. It is also harmful in certain cases, or we would not have testimony against it, but we should use it with care. It is powerful for good, or for evil, if wrongly applied.

DR. SEEGLITZ, in closing the discussion, said he did not hear any remarks made in regard to devitalizing pulps with carbolic acid. He expected to have heard something in regard to that. He did not believe in it himself.

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TENTH INTERNATIONAL MEDICAL CONGRESS, BERLIN. SECTION XIV. DISEASES  
OF THE TEETH.

In accordance with the decision of the Ninth Congress, held in Washington, in 1887, the Tenth International Congress will be held at Berlin from the 4th to the 10th of August, 1890.

By the Committee of Organization at Berlin, the undersigned have been nominated as American officers of the Section, and they earnestly desire that such a delegation shall be present as shall fitly and honorably represent this country. They, therefore, cordially invite your attendance at the Congress, and desire that you will at the earliest moment notify the Honorary Secretary of your intention.

Those who wish to offer any communication to the Congress, or who have anything of interest to present, should send a sufficient abstract of the paper, or a full description of the apparatus, or device, to Prof. Dr. W. D. Miller, West Voss Strasse, No. 32, Berlin, Germany; or it may be sent to the Honorary Secretary, at Cambridge, Mass., for transmission to Berlin.

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J. TAFT, M. D., D. D. S., Cincinnati, Ohio.

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# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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BERLIN, 1890.

We have been requested to say something about going to Berlin, and how to get there. All of the steamship lines do not land passengers in Germany. The North German Lloyd and the Hamburg line have weekly and semi-weekly sailings from New York. By the former the passenger is landed at Bremen, and the latter will take passengers to Hamburg. Both lines touch at English ports, the North German at Southampton, and the Hamburg at Plymouth and Southampton. A round-trip ticket by either line will permit the passenger to land in England, and sail on his return from Germany, and *vice versa*. This will save expense to those who wish to visit Great Britain, France, Belgium, Holland, and Switzerland. The fares are low on the slow steamers and high on the fast ones. Going by Plymouth and Hamburg, round-trip tickets may be purchased for \$110 to \$140. By Southampton to Bremen, \$140 to \$180 will be about the rate for return ticket. Outside rooms are always the highest priced. The English steamships, for comfort, are the best. Most of them land passengers at Liverpool or Glasgow. The Anchor and State Line ships go to Glasgow, and the White Star, Inman, Cunard and Guion lines will land you at Liverpool. Round-trip tickets may be had from \$110 or \$120 to \$160 or \$200, as your purse will allow. We prefer the White Star line of the English fleet. The expense of proceeding from Liverpool to Berlin and back to Liverpool must be counted if you go via England. A comfortable route is to go to Antwerp by the Red Star line, and return by an English line—say the Inman,



return tickets being good either way on these lines. One can go via Rotterdam or Amsterdam by the Dutch line. These vessels are very comfortable, and the fares are low. To one who wishes to go quickly, and who does not wish to visit England, the French line to Havre, Paris, Cologne, Hanover, Berlin, and return, is about the speediest method of getting there. You can leave New York on Saturday, and arrive in Berlin the second Monday evening after by taking one of the fast French steamers. The fare would be about \$100, first class steamer and second class rail, New York to Berlin. Return, not quite so much. The time to reach Berlin via Liverpool will average about ten days by the fast steamers and twelve days by the slow ones. The cost for a four weeks' trip, New York to New York, will be about—

Ticket, New York to Liverpool.....	\$65
On the steamer.....	10
To Berlin, second class.....	25
Return to New York via Hamburg.....	80
On the steamer.....	10
On land, expenses ten days, \$6 per day .....	60
	<hr/>
	\$250

This may be done for \$50 less, by spending two or three days longer on a slow steamship each way. It goes without saying that a longer time may be spent on land, and the cost may be reduced by stopping at inexpensive hotels, of which there are many on the continent. Use Bædeker's Guides ; they are the best.

#### FILLING TEETH WITH GOLD.

This is one of the oldest subjects to be found in our periodical literature, and yet one with probably greater possibilities than any other which the profession has ever written upon. Filling teeth with gold has something of interest in it for every operator, for much of his success in practice depends on his ability to properly perform this operation.

The difficulties encountered by many in the manipulation of gold result largely from a failure to study the peculiarities of the material. Lack of comprehension regarding its capabilities and limitations lead many an operator into serious error, even when he may be an expert in the use of instruments. The one great point

to be borne in mind in filling with gold is, that the ordinary forms of foil, or pellets, as we receive them from the depots, will condense only in the direction toward which the force of the plugger is applied. The so-called spreading of gold is a myth, so far as most of the gold we use is concerned. A good fibrous gold will not spread under the instrument, to any appreciable extent, and any gold which is granular enough to do this is unreliable when the wear and tear of mastication is brought to bear upon it. Gold of this nature may be used in the bottom of cavities to start fillings, but should never be built out to a point where there is any strain placed upon it.

The main requirement, then, for perfect adaptation is to direct the pressure *against* the walls of the cavity. This cannot always be done successfully with the mallet blow, especially in cavities difficult of access, and where nothing but a curved instrument will reach all points. Wherever force is required at an angle diverging much from the shank of the plugger, hand pressure may be used to better advantage than a blow from the mallet. It seems to be a matter of habit with some operators to use the mallet indiscriminately in all regions and at all times. This mallet mania has done much harm, not only in preventing perfect adaptation along difficult walls, but also in chipping delicate margins of enamel. Small pin-head cavities can often be filled as rapidly and to much better advantage with hand pressure, and in all proximal cavities the cervical margin may be covered just as effectively and with greater safety in this way than by mallet force.

When hand pressure is used the best results in adaptation may be obtained by carrying the mass of gold in front of the instrument to the position where it is required, and then directing the force with a tilting or wrist movement, laterally as well as directly—a sort of “insinuating” force which will work the gold into every minute corner. This method is a half-wedging, half-condensing process which, when intelligently carried out, insures good adaptation with little danger to the margins.

Probably the point where the greatest number of gold fillings fail will be found along the wall which stands nearest the operator; as, for instance, the lingual wall in a distal cavity of a left lower molar, the anterior lingual wall of a grinding surface cavity in the same tooth, or the anterior buccal wall of a grinding surface cavity in a right lower molar. These are the walls which look away from

the operator—walls which he cannot see without the mirror and against which he cannot impact the gold with direct pressure. It would be a poor operator indeed who did not get good adaptation against walls which face him, but with these hidden places in the cavity it is quite another matter. There is only one certain method of gaining perfect adaptation at these points, and that is by the use of right-angle pluggers manipulated with vigorous hand pressure. In that way an operator can “pull” the gold against the wall and by working with the mirror can be sure of his filling as he goes along. A strong plea is here made for the use of right-angle pluggers for this purpose, with the belief that if used conscientiously, there will be fewer failures to record in this class of cavities. The handles of the plugger should be large so as to admit of firm grasping in the hand when in use.

Much as we have just said in favor of hand pressure, we do not wish to discountenance the mallet. Used judiciously it is one of the greatest aids to gold filling, and we have one point to mention whereby it may be employed with more comfort to the patient than is ordinarily the case. From the time the mallet is started on the filling it will prove of great benefit to hold an instrument in the left hand with the point firmly placed on the gold or on some portion of the tooth, to steady it during the operation. If left to itself the tooth at each blow from the mallet will be slightly forced in and out of its socket, and this continued irritation sets up an inflammation which renders the operation extremely painful as it nears completion, where heavy malleting is necessary. If held firm by an instrument much of the soreness is avoided, and the operator is enabled to make a hard surface to his filling without too much protest from the patient.

Another point: When operating on the teeth of the left side—especially the lower ones—it will often bring the work under better command, if the operator will step to the left side of the patient. In this position he can condense against walls which, while he was on the right side, were difficult of access. In fact the dentist should change his position at the chair as often as is practicable, not only for the purpose of better reaching his work, but to give his body needed relief from too long-continued standing in an unnatural attitude. When a cavity on the left side of the mouth proves wearisome, try the experiment of moving to that side of the patient and see if matters do not work better for the change.



## THINKING ON YOUR LEGS.

From some little personal experience in editing remarks of speakers and the reading of transactions of societies, we are convinced that more dentists should be readers of good books—especially books on speech-making and logic. Too few of our speakers in dental societies cultivate the art of speech-making to the point under discussion. Too little preparation is made beforehand when papers are to be read, and too little thought is given to elegance of diction (both in writing and speaking.) Wandering from the subject to relate cases in practice is not complimentary to the author of a paper, or the intelligence of the audience.

As the season of annual conventions is upon us, we beg of the speakers who are to open discussions, and those who are burning to speak, to go prepared and do justice to the subject under discussion. Think of what you are going to say, and if you have a defective memory put down the headings and refresh your memory from time to time. It is in very bad taste to interrupt a speaker, as in many cases it throws him off the track, and an otherwise good speech may be spoiled. Think on your legs.

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THE NEW SOUTH.

Feeling the need of a little recreation after the winter's work of teaching, practicing dentistry, and editing a journal, in the company of Drs. Cushing and Brophy, we spent a few weeks in Hot Springs, N. C., and Marietta, Ga. Our journey made us pass through Cincinnati, the whole of Kentucky and Eastern Tennessee. From thence we went to the Hot Springs for the baths and horse-back riding. We then passed through Asheville, and on to Spartanburg, S. C. Later we stopped at Atlanta, and in the company of Drs. B. H. Catching and H. H. Johnson, the old editor and the new of the *Southern Dental Journal*, we looked upon this marvel of reconstruction, the capital of Georgia. Our hosts dropped everything, and gave us a charming ride through the city, which is growing so rapidly, and in their company we visited the State House, a noble reproduction, in many respects, of the National Capitol. We paid our respects to the Governor and other State officers, and discussed dentistry and dentists from medical, dental and social standpoints. They are expecting a large gathering of dentists in July, composing the Southern Dental Association, with Texas at the

head, *yclept* John C. Storey. Everything that we saw and heard evidenced progress, material, financial, and industrial. We were told that the population was growing so rapidly that four or five new dentists had located in Atlanta since January.

They have no mushroom colleges in Atlanta springing up every other week, and the columns of the daily press are not filled with delusive advertisements of "crowns and bridges inserted for nothing," or anything that reminded us of—home. There seems to be a true professional spirit in the new South and we look for great things from our esteemed confreres south of the Ohio River. In returning we visited Chattanooga and Harriman, the phenomenal city just starting on the beautiful Emory River, and by a rare accident we were delayed a day in Cincinnati—too short, but sweet. We had time to see the venerable Taft, who is renewing his youth and expects to go to Berlin, the junior Taft and Smith and the irrepressible Betty, who has just made himself famous by his skullduggery which our readers are already familiar with. To the gentlemen of our profession in the new South we send greeting; our doors are open to you; we expect—we invite you to attend the International Dental Congress of 1893, in Chicago. Will you not come?

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#### MICHIGAN DENTAL ASSOCIATION.

The thirty-fifth annual meeting of this society will convene at Jackson, Mich., June 3d, 4th and 5th. The executive and local committees are earnest in their efforts to secure a large attendance and make the meeting a success. Prominent men from other States are expected to be present, and a cordial invitation is extended to the profession to unite in making this occasion profitable and enjoyable.

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#### SYPHILIS OF THE MOUTH.

Elsewhere in this issue we give space to a reproduction of a pertinent article on this subject by Dr. Bulkley, on syphilis, which will well repay careful perusal. Throw away the rubber dam after using it, and be very sure to disinfect all instruments that come in contact with the gums or mucous membrane of the mouth.

## DOMESTIC CORRESPONDENCE.

## ABOUT STATE DENTAL LAWS.

*To the Editor of the Dental Review :*

DEAR SIR.—Allow me to add a little to Dr. Crouse's knowledge on State dental laws. I see when he clapped his hands and shouted joyfully because Massachusetts enacted a law recognizing no diploma, but requiring all applicants for license to pass an examination. He said, "that is the best law that has ever been passed, in that it will recognize no college, will make graduates stand an examination before they are permitted to practice." Georgia has had such a law in operation for several years, entirely satisfactory to all concerned save an occasional discomfort to an unsuccessful diploma holder. Mississippi has the same law ; so has Arkansas. Let me say just here for those who know it not. Alabama was the first State in the Union to enact a dental or medical law. Nearly fifty years ago she led out in this good work. I was somewhat amused the other day. A would-be recruit to the dental ranks of Georgia from another State was abusing the law system in general. (He had to stand an examination, mind you.) I said to him, "If you are competent, why do you fear the law?" "Oh, I don't fear the law at all. As for me, I don't care for a thousand laws." "Then why are you so solicitous about the fools; as the law is simply to keep out fools." Well, he couldn't answer. He must be a free trade man, out and out.

Only one Southern State is now without a dental law. That is the State of Tennessee, which boasts of three dental colleges. Query: Are colleges inimicable to dental legislation? I remember a Georgia PROFESSOR threw out such a hint last year; but when he heard the deep thunder begin to roll he quieted down.

B. H. CATCHING.

Atlanta, Ga., April 30, 1890.

## THE AMERICAN DENTAL ASSOCIATION AND HER FUTURE.

*To the Editor of the Dental Review :*

DEAR SIR:—A careful observation of the movements and acts of certain members of our profession lead me to the opinion that the next meeting of the American Dental Association is to be one of the most important which it has ever held, for the life of the



association is being endangered. As a member of the association, as one who would like to see it perpetuated, prosper and continue to fill that place which no other body possibly can, I respectfully request space in your journal for the expression of my views on the subject.

In the first place I hear constant rumors that the time and place of meeting is to be changed; a vote was taken and a decision has been arrived at not to change the place of meeting; this is again followed by another rumor that "pressure" will be brought on the officers of the association to change the place of meeting. Now this kind of dilly-dallying is inimical to the best interests of the association; it is outrageously unjust to those who attended the meeting and who voted as the Constitution provided where the next meeting should be held; the wish of those who attended the meeting at Saratoga at considerable expense, ought not to be disregarded by those who were *not* present to vote at the proper time, as to the place of next meeting. If a vote at all is to be taken the only just and fair method is to consult only those who were present at the last meeting. By what right do the officers or any body else ask the absentees where they want the meeting held this year? I protest, Mr. Editor, most emphatically at this course on the part of the officers of the Association. When the meeting has once been decided upon none but the *gravest* of reasons, public calamity or providential interferences should lead to a change of meeting.

A member has a right to lay his plans when the time and place of meeting has been decided upon, and no set of men ought to be allowed to dictate to him, or cause him to be inconvenienced by the sudden, abrupt change of the place of meeting to a point perhaps a thousand miles away. I am a western man, and do not think the American Dental Association meets as often in the West as it should, and when it is once decided to meet in the West, let it alone. Give the dentists of the West a chance once in five years at any rate.

In the second place, I disapprove of all the various means which are employed to weaken the meetings of the association by entangling it with International Medical and Dental Congresses. With the former it cannot consistently affiliate unless it wishes to destroy its identity; while to the latter it needs to give nothing but its sanction. I believe these schemes of having the time of meeting changed to enable certain members to go to Berlin, to

have the meeting of the Association of Dental Faculties and Examiners meet at points other than the meeting-place of the American Dental Association, propositions to hold "memorial meetings in 1892," to interfere with an International Dental Congress in 1893, are all malicious, and intended to disrupt the membership of the association—in fact to accomplish what has been frequently said recently—to disband the association. "It has done its work," "outlived its usefulness," and expressions of that character have a far graver meaning than many surmise. The withdrawal of men from the membership of the association—men who ought to know better and who seem not to appreciate the debt they owe the profession—is but a by-play, a necessary accessory to prove that the association has outlived its usefulness. Enough will hold their membership to close the drama with the *coup d'état*, which they hope will merge this great organization which I love so well into some section of some medical organization.

I believe, Mr. Editor, there is danger ahead, and I consider it your duty to do what you can to counteract these various attempts to weaken the usefulness of the Association and to oppose all schemes and means which tend to create doubt as to the time and place of meeting.

I hasten to close this already lengthy communication with an appeal to all dentists (especially those of the West) to stand by the old and honored American Dental Association, and to do for it all they can to make this meeting in the West (if it is held there at all) one of the most successful in its history. Yours truly,

May 2, 1890.

LORIGA.

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"A NORTHWESTER."

*To the Editor of the Dental Review:*

DEAR SIR: As we at last have Minnesota weather with a breeze from the Northwest blowing directly toward Chicago, we will take advantage of it and freight it with a little gossip about Minnesota's dentists, which may prove of interest to some readers of the REVIEW.

We, of Minneapolis, are really upon the frontier. It is the last post with any considerable garrison as you travel from Chicago to the Pacific; beyond us is little more than a picket-line to the coast, and here we are unevenly distributed. Of the three hundred odd dentists in the State, over one-third are in the "twin cities," whose

centers are but ten miles apart. In Duluth are some fifteen or twenty, but no other city has more than four or five, and outside of the cities named the number in any one place is oftener one or two; so intercourse among the two hundred in the outside towns is limited to the annual meeting of the State Society and an occasional visit to the cities. Still there are bright men, and I think the lack of association is chiefly responsible for the fact that we do not hear more of them. You may ask, "Why are not the city men heard from oftener?" It must be native modesty and diffidence, for we know the columns of the REVIEW have always been open to the contributor from Minnesota, and if Minnesota affairs are not a *feature* of the REVIEW it is our own fault, not the REVIEW's. So to begin to make amends, and possibly when our colleagues see so simple an effort as this in your columns, they may be moved to send something.

As your readers are aware, we have a dental law; pardon us if we say the *best* law in existence. Why? because it defines what a dentist is, and provided that he who comes after its passage must satisfy the agents of the State, viz., the board of dental examiners, that he possesses the necessary qualifications, whether he possesses a diploma or not. To those who object to this I reply with this question: What is a diploma? and answer, that it is a certificate that its holder has fulfilled the requirements of the institution which grants it. Any State *may* receive a diploma as sufficient evidence of the qualification of the candidate. It also has the right to inquire further into his qualifications, or to establish a higher standard than that of *some* institutions granting diplomas. We of Minnesota believe that the State ought to place its requirements at the *highest* point, instead of the lowest (which it would do if it received *all* diplomas at the *same values*), as long as there is not a uniform standard among the colleges, and that an adoption of this clause of the Minnesota law by all the States would immediately compel a uniform standard, and that a high one.

Furthermore, it provides that the bona fide student may have full clinical advantages in an office, may perform all operations—under the guidance of an established dentist—but prohibits any one not a student from performing any operations or, in fact, being anything more than the merest assistant.

It also designates a student as one who is in attendance upon a



continuous course in some recognized college. This clause prevents unprincipled parties from hiring cheap, incompetent men and placing them in charge of "painless joints;" falling back, when they are overhauled by the board, on the statement that they are "assistants."

There are many other good features, and while it, like all human creations, is not perfect, *it has been pronounced valid* by our Supreme Court. (This decision, or abstracts of it, have already or will soon appear in all the leading journals).

Minnesota also has a college—no well-regulated State should be without one at least. The incumbents of its chairs are laboring to make it a high-grade institution, whose object is not so much to make *useful assistants* after the *first* term, as to make *educated dentists* after the *third* term, having an education of both head and hand. It is a department of the State University, so is not dependent upon its *tuition fees* for support, consequently can afford to set its standard high, as numbers are not absolutely necessary to its existence. This competition for students, we think, is the great obstacle in the way of progress to a higher standard.

We have a State society; not a phenomenal one, but a pretty robust child for seven years. A district society, the Southern Minnesota, of which its members may justly be proud; but when you meet a dental Minneapolitan you will soon discover that his pride is the Minneapolis Dental Society. The present cause of that pride is the fact that it has a permanent home in the elegant new public library building, where it meets the third Wednesday of each month. Here also are on file all the leading periodicals of both continents. A reference library is already started which is to have a large addition speedily, and will receive additions from time to time to make it complete. These are *free to all*.

The effect of all this is already apparent in the increased attendance and interest, and I think the members are more proud of this than the numerous other good deeds which they lay claim to, such as organizing the State society, helping St. Paul to organize a society (poor thing it died), entertaining the American Dental Association, etc., etc.

Please excuse us, Mr. Editor, for "loading" this wind so heavily; we are not proud but only anxious to have others see us as we see ourselves.

NORTHWESTER.

April 5, 1890.

## "DOCTOR, YOUR FILLING IS OUT."

*To the Editor of the Dental Review:*

DEAR SIR:—I have just read with interest the March number of the DENTAL REVIEW to the close of Dr. C. N. Johnson's article on Crystalloid Gold. Before going further I wish to have my say about the gold in question.

Months ago Dr. E. S. Chisholm, of Tuscaloosa, Ala., casually remarked in a letter to the writer: "Use Williams' Crystalloid Gold and be happy." On the strength of his judgment, which I regard as fine on all questions, I bought a box of the gold No. 1 and used it. Much delighted. Bought another box; used. More delighted. Another; and I began to sing its praises. I kept on buying and using until eight or ten boxes had been used. Finally a patient, for whom I had performed some beautiful contour operations, called and said, that which we all dislike to hear and of which we never speak "in meetin'," "Doctor, one of your fillings has come out." Several patients made the same complaint about the same kind of operations. I found on examination the lost fillings were the ones made with Williams' crystalloid gold. I would not risk contouring with the gold, but would fill with it to the surface of the cavity and finish with foil No. 4 or 6 folded and cut into strips. I see Dr. Johnson says "his preference yet is for the ordinary foil or pellets in the bulk of the filling." So he, too, doubts the contouring with the C. G. I would like to know if he has had any fillings to "come out." I never found a filling out, but the contour of foil was invariably broken from the base of crystalloid gold. I never was more delighted with anything at the time of using. Now I am not so enthusiastic.

Yours, B. H. CATCHING.

Atlanta, Ga., March 17, 1890.

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[Having been permitted to read Dr. Catching's communication previous to its publication, I have pleasure in noting one or two points in connection with it. I am glad the doctor has written as he has, lest some misapprehension regarding the purport of my paper should gain ground.

I do not use crystalloid gold except as a means of starting the filling. After the first pellet is wedged firmly in the bottom of the cavity, I employ—as intimated in my article—ordinary foil or pellets. I never use a second pellet of crystalloid. I have no more

faith in its strength than has Dr. Catching, and do not fill to the surface of the cavity as the doctor did with the fillings which failed. In this connection I expressed my conviction when I said: "It is doubtful if fillings made from plastic gold have the strength—would stand an equal strain if built into contours—that have those from a more fibrous material"—and while I think the crystalloid preferable to ordinary plastic gold, so far as its working qualities are concerned, I have not sufficient confidence in its strength to use it in the bulk of the filling. The doctor asks if any of my fillings have come out. From the foregoing explanation it will be seen that I do not depend upon it for retention, and I therefore know of no failures since I began its use.

The more I employ it for starting fillings the better I like it, and the fact that, in the cases mentioned by Dr. Catching, the crystalloid remained firm while the contour broke away, goes to prove that the adaptation to the walls is perfect. C. N. JOHNSON.]

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## REVIEWS AND ABSTRACTS.

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HAND-BOOK OF MATERIA MEDICA, PHARMACY AND THERAPEUTICS, including the physiological action of drugs, the special therapeutics of disease, official and extemporaneous pharmacy, and minute directions for prescription writing. By Sam'l O. L. Potter, M. A., M. D. Second edition, revised and enlarged; pp. 766. Price, cloth, \$4. Published by P. Blakiston, Son & Co., 1890, and sold by A. C. McClurg & Co., Wabash Ave. and Madison St., Chicago, Ill.

That a second edition of this work should so soon be called for is evidence of its appreciation by students and practitioners. The author is a painstaking, careful compiler and independent thinker. The work is brought up to date, save in a few minor particulars. Nearly all of the new and hence unofficial drugs have received careful attention, many of which we feel sure will receive a permanent place in the Pharmacopœia of 1890. A careful examination of the contents of this volume, compared with the first edition, shows the addition of much new matter, and indeed evidences the fact that this later effort of the industrious author is intended to be what its title implies—a safe guide in materia medica, pharmacy and thera-



peutics. We commend it to the notice of students who desire to be abreast of the advance guard in therapeutics. The publishers have presented it in an attractive style and the index is very complete.

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ON THE DANGERS ARISING FROM SYPHILIS IN THE PRACTICE OF  
DENTISTRY.

BY L. DUNCAN BULKLEY, A. M., M. D., Attending Physician to the New York Skin and Cancer Hospital, etc.

Happily the recorded instances of the communication of syphilis in connection with the practice of dentistry are relatively few in number, when compared with the very numerous cases on record where the disease has been acquired through other innocent channels; for, it must be remarked, the number and variety of modes by which this disease has been innocently spread from one person to another, entirely without sexual transgression, is many times greater than would be supposed or imagined by one who has not investigated or given some attention to the matter.

The subject of the innocent transmission of syphilis is a very large one, and one to which the public health officials might well direct their attention; but at the present time we can consider only a very small and limited subdivision of it, namely, as the disease may in any way bring danger through or to any one in the practice of a single branch or specialty in surgery, namely, in dentistry.

Although, as before stated, the reported instances where syphilis has been communicated in connection with or during the operations of dentistry are relatively few, nevertheless there are a sufficient number of cases on record not only to show clearly that this unfortunate accident has repeatedly occurred and may readily occur, but also to direct our attention to the methods or channels through which it may take place, and so to point out the means by which the danger may be escaped or avoided.

It would be quite out of place here to attempt a full consideration of syphilis as a disease, or even to give a description of its various manifestations and effects, which are more varied and manifold than those of any other known malady. But before entering upon our subject proper it may be well to recapitulate briefly the points which are well established in regard to the nature and pathology of syphilis, in order that the real dangers arising from the disease may be better understood.

Syphilis is no longer to be looked upon with the utter abhorrence with which it has been regarded in times past, when it was believed to be always the result of sexual transgression; it is not, indeed, to be always considered as a venereal disease, for advancing knowledge has revealed and science has recorded thousands of cases where it has been acquired in ways of which the unfortunate victim was as innocent as is one who catches smallpox, scarlatina, or measles; but, of course, the fact still remains that in the enormous majority of instances syphilis is acquired in sexual intercourse, because here is offered the greatest opportunity for abrasion to occur, through which the poison may gain entrance. But, on the other hand, hundreds or even thousands of physicians and midwives have contracted syphilis in the practice of their calling; in numbers of instances it has been conveyed by vaccination, tattooing, cupping, and breast-drawing, and, in fine, there is no end to the curious and previously unexpected methods by means of which this disease has been innocently communicated from one person to another.

This innocent transmission of syphilis has also occasionally happened in the practice of various departments of medicine and surgery. Not only have midwives acquired the disease in the practice of their calling, but several small epidemics are on record where a number of women, and from them their children and others, have acquired syphilis from a chancre on the finger of the woman who had delivered them; the disease has also been communicated in various surgical operations, and a striking illustration is found in the history of Eustachian catheterization, where as many as sixty cases were traced to the practice of one person. Instances will be given later where it has occurred in some of the operations of dentistry.

Syphilis is a well-defined disease, always depending upon the entrance of a definite, specific poison, which has never been perfectly isolated, and of whose exact nature we know nothing. It is most probably due to a microorganism, but although this has been thought to be discovered on several occasions, it has never been satisfactorily demonstrated, nor have inoculations been made with success by any pure culture of the same. It suffices for our purpose, however, to recognize that there is a poison capable of entering the system and thereby causing syphilis, reproducing itself there, and again under proper conditions communicating the disease to all who are properly and sufficiently exposed to its influence.

The poison always enters the system at some definite point, and at this place generally in from two to four weeks, a local sore, termed a chancre, which is the first sign of the syphilitic invasion, develops. This sore presents quite different appearances under different circumstances and in various localities. These appearances may be learned from many recent text-books and journal articles. The only exception to this mode of entrance of the disease is found in the case of hereditary syphilis, where the poison enters with the life, and possibly in some other rare conditions, which need not be entered upon here.

For the entrance of the syphilitic virus a broken epithelial or epidermal surface is necessary, although apparent exceptions to this rule have been occasionally met. But in some way the poison must come in contact with the absorbing elements of the body, either bloodvessels or lymphatics, and by them be taken into the circulation, where it multiplies and produces its lesions in various parts of the body; and when once the virus has gained entrance the individual is syphilitic, and unless the disease is checked by treatment, it will go on producing its manifestations, even for many years.

The period during which syphilis is actively inoculable has never been definitely determined, and will probably never be accurately known. It is certainly very contagious during the first year, and also for many months thereafter, and cases are on record where infection has occurred from cases many years advanced in syphilis; indeed, the period where danger ceases has never been determined. Although it is questionable if syphilis is often communicated by patients five years after their infection, no prudent man would take even a shadow of a chance of personal inoculation at this or even at a very much later period. Treatment, of course, greatly modifies the infective power of the disease, and the contagious character of syphilis, even in the earlier stages of the disease, is greatly lessened, if not entirely destroyed in some cases. But all these "ifs" and qualifying statements only show what a dangerous and treacherous affection we have to deal with, and how difficult it is always to be certain of immunity from danger.

The poison of syphilis may be received from three different sources: 1. From the initial sore or chancre; 2. From mucous patches; 3. From syphilitic ulceration; and 4. From the blood. These we briefly consider in the above order.



The chancre, or initial sore of syphilis, is occasionally formed upon the lips, tongue and other portions of the buccal cavity, but generally the lesion is so marked and painful that the patient avoids the dentist and there is relatively little danger of infection from this source. But infection does sometimes occur, as in an instance which fell under my own observation, about to be described, where the gentleman, supposing that the chancre was only a local sore due to sharp and rough teeth, went to his own dentist and had them filed off, when the ulcer was very painful, and giving off an abundant virulently contagious secretion ; so that his dentist must certainly have become exposed to the same. It is well, therefore, in the case of doubtful sores about the lips, tongue or mouth, either to be assured of their harmless nature or to exercise such precautions as will insure perfect protection to self and others, which will be considered later.

The second source of the contagion, namely, mucous patches, is far more fruitful of infection, and that against which special care must be exercised. It is to be remembered that at one time or another these lesions appear to a greater or less amount on the buccal mucous membrane of almost every case of syphilis, so that at some time almost every case is capable of communicating the disease from this source. Mucous patches are slightly raw surfaces of various sizes and shapes, which are at first slightly elevated, and then may become depressed by the loss of the epithelial covering. When newly developed they are of a redder color than the normal mucous membrane, but later may become grayish-white. They are always superficial and often do not cause much annoyance, so that the patient may readily attend to all the duties of life, and may go through considerable dental manipulation while having an abundant crop of mucous patches on the tongue, lips or buccal cavity. The secretion from them is sticky, and intensely contagious. It is from these lesions that fresh chancres are most commonly contracted, and it is this secretion which adhering to instruments and articles such as cups, spoons, pipes, etc., give rise to syphilis in most unexpected manners.

Certain deeper ulcerations of syphilis may sometimes give rise to contagion, especially when they occur in the earlier stages of the disease ; but practically very few instances of contagion from this source are known, although this danger also should always be guarded against.

The fourth source of syphilitic infection, namely, the blood, is the least likely to present dangers in connection with dentistry ; it is, however, quite possible for blood which is drawn during an operation, or by accident, to communicate syphilis, if by chance it finds an opportunity to enter another individual. It is just this uncertainty in regard to the possibilities of infection, which gives to our subject such great practical interest ; in few, if any, of the dozens of methods by which the disease has been innocently transmitted from one person to the other was the possibility of such an accident known or even suspected beforehand.

We will now consider some of the observed facts in regard to the communication of syphilis in dentistry, and afterward examine the modes of transmission and the means of prevention. Our clinical study will naturally divide itself into two lines of thought: 1st. In regard to the dangers from syphilis to *patients* undergoing dental operations; and 2d. In regard to dangers to the *operator*.

Inasmuch as it presents many points of interest, relating both to the patient and operator, I may be allowed first to relate the case alluded to which came under my own observation and treatment, and which first called my attention particularly to the subject :

Mr. X. W., a gentleman of intelligence and position, aged sixty years, came to me September 11, 1884, on account of a sore on the tongue which he feared was a cancer. The history was, that some ten weeks before his first visit, he had first noticed a little point of soreness, which had gradually increased in size, in spite of treatment, until latterly it had given him considerable annoyance, so that he was conscious of its presence at all times. The true nature of the sore had evidently not been recognized.

On examination there was found on the right side of the tongue about an inch from its tip, a hard, inflamed mass, nearly half an inch in diameter, the center ulcerating, and the edges somewhat everted. It was not painful, except when irritating food or drink touched it. The two upper molars were found to have sharp and rough edges, and he had been wearing a red rubber plate until recently. There was a small, enlarged and painful gland beneath the jaw on that side.

Thinking that the ulcer might possibly be due to irritating local causes, he was given a soothing mouthwash, and an alkali internally. Five days later there was a marked improvement in the condition of the ulcer; it had a less angry look, but its edge was

more clearly defined as the inflammatory element had somewhat subsided. He had been of his own accord to his regular dentist, and had had the roughened teeth made smooth, and had left out his set of artificial teeth.

From a careful second study of the case I then felt convinced that the sore was a chancre, a primary lesion of syphilis, and he was immediately put on antisyphilitic treatment; the general eruption and other symptoms which followed a few weeks later rendered the diagnosis certain, together with the remarkable manner in which the sore healed and symptoms vanished under proper treatment for syphilis.

In searching for the mode by which the syphilitic poison had gained entrance, it was learned that during the month or so previous to the appearance of the sore upon the tongue he had, through the persuasion of a friend, been under the care of a dentist of the cheap, advertising order, who, he had noticed, was not at all cleanly either in his person or with his instruments. He could not locate the exact date of the injury to the tongue by the dentist's instruments, but work had been done in that locality, and he remembered the instrument occasionally slipping, as will often happen, and inflicting injury to the soft parts. He was a married man with a family, and was very desirous of learning how he had become infected; he had certainly not been exposed in sexual intercourse, nor in any other manner which we could discover.

The interesting points of the case are: first, that while the proof is not absolute that he was infected in the dentist's chair, still the circumstantial evidence is so strong that little, if any, doubt can be entertained that the poison came through this channel.

The habits and methods of the particular dentist were such that poisonous material from the mouth of a previous syphilitic patient could readily have been transferred on instruments, or otherwise, to the wound made in the tongue, either by the sharp teeth or by a slip of an instrument. The second interesting point is that this patient, before the true nature of the disease was ascertained, had been to his own regular dentist for smoothing the teeth, and so had certainly exposed him, and others through him, to the poison which was secreted freely from the raw surface of the chancre.

The earliest recorded cases of the transmission of syphilis in dental operations are in connection with the transplantation of teeth, during the last quarter of the eighteenth century.



Sir William Watson<sup>1</sup> published a case of this description, and John Hunter<sup>2</sup> relates two similar cases, about which there can be no doubt. J. C. Lettsom<sup>3</sup> also recorded three cases. Of these one was personal, one was seen by a Dr. Hamilton, and the third occurred in America, having been observed by Kuhn in Philadelphia; these gentlemen furnished notes of the cases to Dr. Lettsom. This mode of transmission does not occur again in literature, to the knowledge of the writer, although Gibier<sup>4</sup> says that "cases have been recently related." In view, however, of a recent revival of the operation of tooth transplantation, it is quite possible that the future may furnish fresh instances of this mode of the innocent acquiring of syphilis.

From this period no other cases of the transmission of syphilis through dental procedures are found recorded for nearly a century; indeed, not until the advent of modern operative dentistry and active medical observation.

The first case met with is one reported by Dr. C. W. Dulles,<sup>5</sup> of Philadelphia, and which was also seen by the late Dr. Maury. The patient, a female domestic, of excellent character, developed a chancre of the lip two weeks after a visit to a dentist, who on that occasion extracted a tooth, and later did some cleansing of the teeth. Although no confirmation was obtained, it seemed reasonable to suppose that the operation of extraction was in some way responsible for the inoculation.

Dr. F. N. Otis<sup>6</sup> also mentions a chancre of the lip which occurred in a gentleman "about three weeks after a morning spent in a dentist's chair." Lancereaux<sup>7</sup> relates a similar case of chancre of the lower lip in a woman, after extraction of a tooth and other dental work; and Giovanni,<sup>8</sup> of Bologna, has reported a chancre of the lip, apparently from a dentist's instrument.

<sup>1</sup> Watson: Transactions College of Surgeons, 1785, iii. p. 328.

<sup>2</sup> Hunter: Treatise on the Venereal Disease, 1st English edition, 1789; 1st American edition, Philadelphia, 1818, p. 362.

<sup>3</sup> Lettsom: Transactions London Medical Society, vol. i., 1787, p. 137.

<sup>4</sup> Gibier: Ann. de Dermat. et de Syph., 1882, p. 129.

<sup>5</sup> Medical and Surgical Reporter, January, 1878.

<sup>6</sup> Lectures on Syphilis, New York, 1881, p. 102.

<sup>7</sup> Proceedings Academie de Medecine de Paris, L'Union Medical, 1889, xiviii. p. 655.

<sup>8</sup> Lo Sperimentale, 1889, p. 262.

## IOWA STATE DENTAL SOCIETY.

The twenty-eighth annual meeting of the Iowa State Dental Society convened at Amitie Hall, Dubuque, Iowa, May 6, 1890. After roll-call, Mayor R. W. Stewart delivered an address of welcome, which in the absence of Dr. R. L. Cochran, was responded to by Dr. L. C. Ingersoll. Dr. I. P. Wilson, of the committee on History of the Society, made a verbal report, and the committee was continued. Many of the members of the other committees not being present their reports were deferred till later in the session, as were also the reports of the officers of the society.

The president, Dr. F. M. Shriver, announced that the offices of Vice-President and Treasurer had become vacant during the year, and that he had appointed to fill the vacancies Dr. C. J. Peterson, of Dubuque, as Vice-President, and Dr. Ben Price, of Iowa City, as Treasurer. On motion of Dr. J. B. Monfort, an invitation to attend the meetings was extended to the physicians, visiting dentists, and all interested in the profession. Adjourned.

After reading of the minutes of the morning session, the president's address was delivered by Dr. F. M. Shriver. Dr. T. L. James, of Fairfield, read a paper on "Pulp-canals of Human Teeth," which he illustrated by prints made from longitudinal and transverse sections of teeth, and by charts. The discussion of the paper was participated in by Drs. I. P. Wilson, A. O. Hunt, J. T. Abbott and C. J. Peterson. Dr. L. C. Ingersoll read a paper on "Pain Obtundents and Local Anæsthetics." Discussed by Drs. Abbott, James, Mullett, Wilson, Rogers, Peterson, Hunt and Clarke. Dr. A. O. Hunt gave a lecture on "Light for Operating Rooms," and illustrated his remarks by blackboard drawings, showing his arrangement of mirrors. Drs. Fullerton, James and Wilson, made remarks on this subject. Adjourned.

7:30 p. m. Dr. McCandless read an essay which he entitled "Hash," and touched upon a great variety of subjects in both operative and mechanical dentistry. The remainder of the evening was occupied in a discussion of the paper, which was generally participated in by the members of the society. Adjourned till Wednesday, May 7, at 9 a. m.

## SECOND DAY—MORNING SESSION.

The forenoon was devoted to clinics. Dr. C. N. Johnson filled some crown cavities with gold, using crystalloid to start the fillings.

Dr. S. S. Southworth, of Sacramento, Cal., illustrated the use of his flash lamp to anneal the surface of a broken filling. After the surface was cleaned and the flame had come in contact with it a piece of No. 30 gold foil cohered at once.

A very interesting case of erosion of the four superior incisors was shown. This was said to be due to an acid secretion from the labial mucous membrane. Prof. Hunt said the treatment indicated was to puncture the follicle with the electric needle and destroy it. The erosion, it was said, would cease after this operation.

Dr. J. W. Wassall filled the root canals of a lower molar tooth with chloro-percha and gold wire.

Dr. E. C. French of Eau Claire, Wis., exhibited a plate with 18 specimens of abnormal teeth. Several of these teeth had from four to five roots.

Dr. F. W. Blomily, of Sioux Falls, demonstrated the casting of an upper denture by the Carroll aluminum process. This was made for rubber attachment.

Dr. French exhibited a cast showing *four* lateral incisors.

Dr. J. B. Monfort filled a cavity on the distal surface of an inferior second molar, using the back-action Abbott mallet.

Mr. E. E. Clark exhibited specimens of the electro-metallic plate.

Dr. C. Thomas inserted a gold inlay on the mesial surface of a superior molar.

Dr. S. C. Hatch exhibited 17 teeth extracted from one mouth on account of extensive salivary deposits. The patient was a lady about forty years of age; and after the teeth were extracted she regained her former good health.

A representative of the Daly Gold Lining Company was present and exhibited specimens of this work.

#### WEDNESDAY AFTERNOON SESSION.

The meeting was called to order, President Shriver in the chair. The report on the morning's clinic being first in order, Dr. C. N. Johnson gave an account of the operations he had performed. In reply to Dr. Peterson's question, he stated that he considered that the gold on account of its quality of being closely and easily adapted, was peculiarly useful for starting cavities in any teeth; but it was not advised for contouring because of lack of strength. Dr. Wassall described his clinic on canal filling with chloro-percha and



tapered gold wire points. Dr. Southworth described his appliance for drying (or annealing) a broken or moist surface of a filling so that it can be repaired by adding new gold. This is accomplished with an alcohol flame thrown against the surface.

Dr. Dickinson for the Committee on New Inventions and Appliances, reported the following: The New Cord or Weber-Perry Engine; Cervix Screw Clamp, the invention of Dr. How; Bing Root Trimmer; How's Root Trimmer; Nevius Reversible Mouth Prop; Merriam Files, as described in *Archives* for March.

Dr. Elliott, of Hartford, furnished Separator, Rubber Dam Holder and Rubber Dam Weight. Dr. Ivory, of Philadelphia, Double Bow Separator, Matrix Retainer, Canal Broach. Dr. Gilson, Rubber Cloth Disk and Sand-Paper Disks. Baltimore Rubber Clamp. Sibley's Felt Gold and Amalgam. Dr. Peterson a Hot-Air Syringe and Stand, so made that the air passes through fifteen inches of warmed tube. Vernon Crown Drivers. Dr. Gantz, of Humeston, Serrated or Saw-pointed Chisels for opening crown cavities. Illinois Dental Manufacturing Co., Saw Frame; Dr. Dickinson's Needle-Holder. Dr. Johnson, Waste Cotton Receptacle, invention of Dr. Patterson, Toronto, Can. Dr. Charles T. Howard, Thin Cloth Finishing Strips. Medicated Gelatin, as recommended by Dr. Ames. Teague's Impression Compound. Dr. Palmer's Daily Journal (for recording operations).

Dr. Crouse made an earnest presentation of the claims of the Dental Protective Association.

Dr. I. P. Wilson read a paper, entitled: "Pathological Conditions of the Ethmoid Bone resulting from Dental Lesion."

The first portion of the paper was devoted to a lucid description of the anatomy, physiology and relations of this bone. He said that medical literature has very scant accounts of pathological conditions in this bone, and related some cases of diseased ethmoid as a result of affections of the teeth. In the first case described the disease extended up through the antrum to the spongy bones. The chief diagnostic sign was pain in the region between the eyes. At least 90 per cent of the cases met in his practice resulted from diseased roots of molars.

The treatment of these cases is rendered difficult by the inaccessibility of the parts. This should begin with the removal of a cause in the teeth and the treatment of the antrum. The disease in the spongy bones may, however, persist independently.

This is treated by antiseptics in a medium of vaseline. Having encountered a half score of such cases in two decades, he thinks he has not overestimated its importance.

## DISCUSSION.

DR. SUDDUTH: He does not think the subject capable of much discussion. Diseases of the ethmoid have long been known to medical men. He had had no cases in his own practice, and he thought that the essayist deserved much credit for his work.

DR. HARLAN: He thought a new phase of the the subject had been brought forward in noting the relation of ethmoidal to antral disease. One case had come under his notice—an Irish woman. In injecting fluid through a root the fluid came out through the nostrils via the antrum. But a discharge from the diseased condition in the ethmoid continued. This was terminated in due time by a physician's treatment. He thinks dentists ought to consult with rhinologists in such cases.

DR. THOMPSON, of Topeka: He has found no ethmoidal complications in his few cases of antral disease. He also believes that dentists should consult with nasal specialists.

DR. INGERSOLL: He could now account for the obstinacy of some of the diseased antra which had come under his care. We were still tardy as dentists in recognizing the intimate relations of the teeth to the surrounding parts. Pathological conditions in the teeth will be transmitted beyond the immediate seat. The essayist had suggested another field to which dental disease may extend.

DR. A. H. THOMPSON: He sees a close relation between oral and nasal disease in the frequent concomitant processes of pyorrhœa alveolaris, and nasal catarrh. He thinks it essential that in cases of pyorrhœa alveolaris, the patient should be examined by a rhinologist for nasal catarrh.

DR. JENISON, of Minneapolis: Related a case which came under the care of Dr. Weeks and himself. Mouth swollen "full" with fistulæ, externally and internally. Primary cause, a pulpless left upper molar. Involving the alveolar ridge extending to the orbital plates. Removal of diseased portions and cleansing dressings resulted in cure.

## WEDNESDAY EVENING SESSION.

Meeting called to order by the President at 8 o'clock.

The first order was the election of officers, which resulted as follows: President, Dr. C. J. Peterson, Dubuque: Vice President,

Dr. S. C. Hatch, Sioux City ; Secretary, Dr. G. W. Miller, Des Moines ; Treasurer, Dr. Benjamin Price, Iowa City.

Sioux City was selected as the next place of meeting.

Dr. A. W. Harlan, of Chicago, then read a paper on "The Use of Diffusible Medicaments in and Around the Roots of Teeth." The discussion was opened by Dr. I. P. Wilson, who said the paper was intensely interesting. He questioned, however, that the gases passed into the cementum. The tooth has two sources of life—from the pulp and the cementum. In the experiments the teeth were dead and there is no resistance to gases as would be in a living tooth. Effects of arsenic stop between dentine and cementum in a living tooth, and the effect of gases would likely stop also at that point. These are the only points he questioned.

Dr. INGERSOLL : The experiments showed a laudable attempt at arriving at the truth. But the conclusion that because the odor passed through, disinfectants also passed, seems to him to be not well taken.

Dr. THOMPSON, Topeka : Thought that self-limiting remedies were sometimes called for ; for instance, diffusion should not take place through the peridental membrane.

Dr. CROUSE, Chicago : The preparation of perchloride of mercury will disinfect well and it has no odor, so that remedies with an odor are not always necessary for disinfection. Felt sure he had disinfected teeth with carbolic acid but it probably took longer, so he now favors other disinfectants, such as permanganate of potash, mercury, etc. The oils that give most odor are not always best disinfectants.

Dr. Sudduth : This is a vital question. Dr. Miller's theory is that micro-organisms cannot pass through dentine and cementum to cause harm if the apical foramen is closed, but injury may occur if putrefaction has gone on in the tooth till gases have been formed. Any means which will perfectly dehydrate a canal and keep it so is effective enough, if the apical foramen is thoroughly closed. It is not necessary to drug so extensively with diffusible medicaments.

Dr. Ingersoll would ask Dr. Sudduth if dehydration would thoroughly destroy micro-organism in the canal? Would not the microbes revive when the moisture came again?

Dr. Sudduth : If the apical foramen is closed, moisture will not permeate the dentine again.



Dr. Wilson would ask Dr. Sudduth through what means will an implanted tooth change color after implantation, if it does not absorb moisture.

Dr. Sudduth: Does not say that there is absolutely no absorption of moisture in a tooth, but not enough through the root to renew germ life in canals.

Dr. Harlan: The paper treated only on the effect of diffusible medicaments through dentine.

Question by a member—What if you do not disinfect dentine?

Dr. Harlan answered: Inadequate disinfection will result in enfeebling the periodontal membrane in time.

Dr. A. O. Hunt asked what would prevent gases escaping from tubuli at the time of treatment.

Dr. Harlan: It has probably taken months or years for dentine to become permeated with mephitic gases, and a few moments' treatment will not destroy them. Dr. Ingersoll has said that disinfection does not necessarily pass through dentine because the odor passes through. It is a demonstrated fact that volatile camphors are deposited at a temperature of 94° F., and that they readily follow their odors on account of their volatility.

Dr. H. thought that coagulants were useful in their place, as Dr. Thompson has said, but not to be used in pulpless teeth. In regard to what Dr. Crouse said, he himself prefers disinfectants which are odorless, if possible, but it is sometimes more effective to use those with an odor.

Dr. I. P. Wilson moved that the Iowa State Dental Society endorse the action of the Dental Protective Association, and bid Dr. Crouse God-speed in his good work. This was carried unanimously.

#### CLINICS—THURSDAY MORNING.

Dr. Monfort, a gold filling in distal surface of lower second molar, demonstrating back-action blows of Abbott mallet.

Dr. J. J. Reed, of Chanute, Kan., showed a blow-pipe peculiarly adapted for use in places where illuminating gas is not at hand. It employs gasoline. The gasoline is contained in an ordinary sized chemist's wash bottle, about half filled with the gasoline. The rubber stopper is perforated with a glass tube extending to nearly the bottom of the bottle, to which a rubber tube connecting with the foot blower is attached. A short tube through the stopper

has connected with it the rubber tubing terminating in a blow-pipe. Used with a small spirit lamp, a very hot flame is given.

Dr. Munn, a gold filling in a proximal cavity of bicuspid. Started with Watts' crystal gold and finished with ordinary foil, electric mallet.

Dr. K. M. Fullerton, Cedar Falls, a bicuspid, all gold crown. The lesson was in obtaining the occlusion. The gold band being adjusted to place, modeling compound was filled into its open end and the occluding teeth were closed into it. This was modeled into proper form and removed from the mouth. Dies and counter-dies were then made with Mellotte's materials, and a cap struck therefrom.

Dr. C. S. Searles, Dyersville, demonstrated the Patrick system of making crowns.

Dr. F. B. Clark, gold filling, showing use of How's cervix screw clamp.

Dr. Angle exhibited instructive applications of his apparatus as used for splints in maxillary fractures.

#### THURSDAY AFTERNOON SESSION.

Society called to order at 2:15 o'clock.

Superintendent of clinics made report as follows: Dr. F. B. Clarke made a filling in left second bicuspid buccal cavity, using How cervix clamp.

Dr. E. W. Munn, two large gold fillings in left upper bicuspid mesial and distal, using electric mallet.

Dr. French swaged an aluminum plate very successfully.

Dr. Monfort, gold filling lower second molar, distal cavity, using Abbott's back-action mallet.

Dr. A. H. Thompson, of Topeka, read a paper on "Cements in Dental Therapeutics." Abstract as follows: "We need a fuller knowledge of cements; when best to use them, etc. We need more uniformity in preparation from manufacturers. The greatest requisite is a quality which makes the filling adhere to wall of tooth. If adhesion is good, moisture is shut out and decay stopped. In teeth of soft structure, cements are indicated for lining. Metals cannot preserve so well. In anterior teeth, cavities should be lined with cement for artistic purposes; it having a tendency to lighten the tooth. Zinc phosphate is indicated in soft teeth and in young patients, for hardening the teeth. Children should not be

subjected to long operations—especially weak children. Also in old age cements may be used to advantage, and for invalids till health is regained. In very sensitive teeth cements should be used till sensitiveness is reduced. Phosphates are indicated for this purpose. Death of pulp will not occur under phosphate oftener than under any other material. Oxy-chloride should not be used in living teeth on account of its irritating qualities.”

## DISCUSSION.

DR. A. O. HUNT: The only point to take issue with is in regard to use of oxy-chloride in live teeth. If it is necessary to get therapeutic effect of a filling, oxy-chloride is more effective than phosphate, and if not placed too close to the pulp it will not destroy it. Think we would get more permanent results if we coated cement filling with chloro-percha at the time of insertion. It keeps cement protected and dry till crystallization is perfect. The zinc cements are unfortunate in the fact that the materials will absorb moisture even before being mixed, if exposed often to the air. If we could prepare the materials—the liquid and powder—just at the time of using we would likely get better results, as deterioration would not take place before mixing the materials.

DR. G. NORTH: Thinks that the mixing of cements has a great deal to do with the durability. The proper proportion of powder and liquid should be used, and either one or other ingredients should not be added after crystallization has started.

Dr. M. G. Jenison, Minneapolis, then read a paper on “Photography in Dentistry and Medicine.” Illustration has done much to bring historical records down from past ages. Pictures can be comprehended quicker than words.

In dentistry a lesson can be taught more effectively by illustration than by explanation, and records can be preserved better in this way than by models, appliances, etc. Outlines of the face in irregularity can be taken at various stages of the operation to convince the patient of the progress of the work.

The accuracy of a drawing is always open to question, but the sunlight never makes a mistake.

Cases can be kept in a convenient blank album and always be at hand.

The more we can condense scientific knowledge the better may we teach the profession, and by photography we are enabled to impress any point on the observer.



Dr. Brady, of Minneapolis, read a paper on "Educational Methods in College and out."

Inclination toward studying methods of education is characteristic of the Nineteenth century.

As a rule our dental colleges teach too much theory in comparison to the amount of practice. The college courses are too short. At least three years should be spent and a term of nine months. Competent demonstrators should be employed. The demonstrator should be an important member of the faculty and be a qualified man. A student should be educated before matriculation. Operative and prosthetic lectures should be a prominent feature in every college. There are some features of education outside of the college. Society work could be bettered by more frequent meetings. Patients may be educated by properly written newspaper articles, and by popular lectures in the public schools. Methods of illustrating points to patients were exhibited.

Dr. L. F. Kellogg read a paper on "The Protection of the Dental Pulp." The general temperament of the patient should be considered when capping pulps. None but healthy pulps should be capped. A soothing antiseptic antiphlogistic capping material should be used.

The principle of aseptic surgery must always be carried out. Irritating cements should not be placed in direct contact with the pulp. Some soothing material should intervene.

Paper by Dr. J. T. Abbott. Remarks to young practitioners. Topic: "Cast thy Bread Upon the Waters." Advocated caution to younger men. The student of dentistry to-day has no such hard road as the student of years ago; but to-day we are reaping the benefit of what was sowed by them.

To the beginner would say that the temptation will be great to lower fees to get patients, but if the practitioner stands firm he is casting bread upon the water and will gain the respect of the profession and the people. Use good material in your practice and you cast bread upon the water. Always speak well of a competitor, if he is deserving; If not, do not speak at all. Do not become slovenly. Be clean, and you cast bread upon the water. Give directions to patients as to care of the teeth. Make it continuous, line upon line—precept upon precept. All the seed will not take root but some will. Do not use technical terms in talking to the patient. Show patients their responsibility in the length of

time which the fillings will last. Do not attempt to regulate teeth without co-operation of the patient. When failure occurs the dentist is blamed, whether he is in fault or not.

## DISCUSSION.

Dr. Dickinson then showed a very effective blow-pipe invented by Dr. Reed, of Chanute, Kansas. It is used with gasoline and is convenient where illuminating gas is at hand, and is very effective.

## THURSDAY EVENING.

Dr. W. X. Sudduth delivered an illustrated lecture on "The Blood, Its Source of Origin and Morphology." He described the appearance of the third corpuscle discovered by Basil Norris.

## FRIDAY MORNING.

Dr. E. R. Mullett read an essay on "Root Filling."

To destroy pulps of superior incisors removes debris and applies crystals of cocaine, using moisture enough to dissolve them. Leaves it about five minutes, then picks into pulp; applies more cocaine, waits a little longer and continues picking process. Can reach apex in from ten to fifteen minutes. Removes pulp with barbed broach; wraps smooth broach with cotton and saturates it with equal parts of carbolic acid and oils of cloves, cinnamon and wintergreen and leaves dressing in pulp canal for a varying length of time as case may indicate. If root is to be crowned, removes dressing and fills end of pulp canal with tin point, which he makes, cutting piece of tin to approximate size; introduces into canal, taps with mallet, removes and shapes until perfect adaptation is obtained; then cuts to desired length and forces to position. If canal is constricted or contains pulp nodules, uses Morey drills, but only when root is to be crowned. When pulp cannot be all removed painlessly by use of cocaine, uses arsenious acid. Cautioned against forcing portion of pulp to apex and leaving there. Where tooth is to be filled uses dressing of carbolic acid and essential oils as in root for crowning; removes cotton; dries with broaches wrapped with cotton; introduces chloro-percha; removes excess and fills with gutta-percha points. For canals too small to fill with gutta-percha points, uses points of silver, also sometimes gold platinum or tin. Where there is a fistulous opening forces medicament through. In case of blind abscess, prefers to cut through gum and process to end of root and apply medicament directly to seat of trouble. The result is surer.

Dr. Mullett submitted four teeth with pulp cavities filled, while roots were embedded in gutta-percha, 14 teeth with roots embedded in modeling compound and held in holes bored in a piece of wood and filled there.

Dr. Mullett requested that a committee be appointed to examine the root filling by filing the roots and exposing them to view. Those examined up to time of adjournment were found thoroughly filled.

#### DISCUSSION.

DR. THOMPSON: Were the teeth just extracted? The resistance of moisture is not the same in a tooth recently extracted and one that has been a long time out of the mouth.

DR. MULLETT: They had been out of the mouth for some time, but had been thoroughly washed with per oxide of hydrogen.

DR. INGERSOLL: What was the position of the teeth when filled? Were they placed in the inverted position they occupied when in the upper jaw?

DR. MULLETT: They were held in the easiest position in which the work could be done.

Subject passed.

#### DISCUSSION OF DR. SUDDUTH'S LECTURE.

DR. INGERSOLL: Was much interested in the physiological aspect of the blood. Requested Dr. Sudduth to again explain the nature of the white blood corpuscle, which he accordingly did as in the lecture the previous evening, declaring its presence in the blood to be accidental.

DR. HUNT: May it then be considered a foreign body?

DR. SUDDUTH: To a greater or less extent it is. It plays a small part in the reparative process, as more is known of the blood the less important it is found to be.

Subject passed.

Dr. Breen's paper on "Infection and Disinfection" was read by title, and after the transaction of routine business the Society adjourned to meet in Sioux City the first Tuesday in May, 1891.



## DENTAL COLLEGE COMMENCEMENTS.

## UNIVERSITY OF PENNSYLVANIA—DEPARTMENT OF DENTISTRY.

At a public commencement, held Thursday, May 1, 1890, at the American Academy of Music, Philadelphia, Pa., the degree of Doctor of Dental Surgery was conferred by William Pepper, M. D., LL. D., provost, upon the following (66) gentlemen, after which an address was delivered by J. William White, M. D., professor of clinical surgery. The number of matriculates during the session was 159.

Hinrich Addicks, Germany.  
 William E. Barnard, Md.  
 Ira C. Bowman, Pa.  
 Frank S. Burket, Pa.  
 Wilhelm Chemlin, Germany.  
 Frederick G. Clement, Pa.  
 Alfred J. Cohn, Wis.  
 James D. Compton, Pa.  
 Henrique S. do Couto, Brazil  
 J. Ernest Crothers, Ohio.  
 Kirk A. Davenport, N. Y.  
 William S. Davenport, N. Y.  
 William W. DeHaven, Pa.  
 Justino S. Dilk, Brazil.  
 Carl Doebbelin, Germany.  
 Johann Otto Drossel, Switzerland.  
 William C. Dunn, Pa.  
 Owen J. Eagan, Mass.  
 Charles A. Emerson, Ohio.  
 Delbert D. Fair, Ill.  
 Clement de Faye, Switzerland.  
 Edward de Faye, Switzerland.  
 George L. Fenn, Conn.  
 A. Kay Finlayson, Scotland.  
 Aloysius Flotzinger, Pa.  
 Stewart Freeman, Nova Scotia.  
 Arthur T. French, Fla.  
 Edwin A. Geilfuss, Wis.  
 John Girdwood, Scotland.  
 Edwin D. Graves, Pa.  
 J. A. Jacob Haupt, Pa.  
 Karl Heitmuller, Germany.  
 Sabourin Holly, Hayti.

L. Stanford Hyatt, Pa.  
 G. Edward Hyndman, Canada.  
 Harvey N. Jackson, Wis.  
 George I. Keener, W. Va.  
 Thomas B. P. Knight, Pa.  
 George C. Kusel, Pa.  
 James G. Lane, Pa.  
 Frank J. Lankester, England.  
 Nowman W. Leard, Prince Ed. Isl.  
 William L. Leech, Pa.  
 Moritz Lohoff, Germany.  
 Rafael M. Lombard, Cuba.  
 John G. Ludwick, Pa.  
 Frank M. McCartney, Pa.  
 Harry D. Matten, Pa.  
 David A. Norton, Wis.  
 Patrick J. O'Hara, Pa.  
 George S. Proctor, Pa.  
 Abe L. Pugh, Pa.  
 Herbert D. Requa, N. Y.  
 Edwin L. Romig, Pa.  
 Santiago Sacaza, Nicaragua.  
 Lawson S. Shennan, Scotland.  
 Charles L. Snyder, Ill.  
 Walter A. Spencer, Pa.  
 Frederick W. Stevens, Nova Scotia.  
 Howard T. Stewart, Miss.  
 Horace B. Story, Ohio.  
 Will H. Trout, Pa.  
 Francis P. Valiente, Cuba.  
 Herbert D. Whitmarsh, N. Y.  
 G. Frank Williams, Conn.  
 Linneaus B. Wood, Mass.—Total 66.

DEGREE CONFERRED JUNE 5, 1889.

Samuel S. Lowry, Pa.  
 Jesus Ruitz, U. S. Colombia.

Domingos P. Ribas, Brazil.  
 Frederick Sauters, Pa.

## BALTIMORE COLLEGE OF DENTAL SURGERY.

The Semi-Centennial Commencement Exercises of the Baltimore College of Dental Surgery were held at Ford's Opera House, Baltimore, Md., on Thursday, March 20, 1890. After prayer by His Eminence, Cardinal Gibbons, and the announcement of graduates by Prof. R. B. Winder, Dean, the degrees were conferred. The annual oration was delivered by the Rev. S. D. Noyes, of Kingston,

N. Y. The valedictory by U. V. Withee, of Maine. The degree of Doctor of Dental Surgery was conferred on the following named (72) persons :

J. B. Archer, Cal.	W. W. Niles, N. Y.
J. P. Bayon, La.	J. A. Noll, N. Y.
T. A. Beal, Pa.	H. Ordonez, S. America.
A. L. Beard, Wis.	B. M. Oxley, N. S.
J. Noyes Beemer, N. Y.	J. E. Parker, Cal.
J. H. Benton, M. D., N. C.	J. T. Parker, Cal.
H. J. Burkhart, N. Y.	L. R. Pennington, Del.
J. Clarence Busey, Md.	G. A. Potter, N. Y.
A. Foley Butler, Md.	W. S. Pyle, Md.
J. E. Davidson, Ga.	F. M. Readio, Mass.
C. R. Diffenderfer, Md.	R. W. Reese, N. C.
H. A. Donaldson, D. C.	E. H. Reed, Ga.
J. E. Dugger, N. C.	H. N. Richardson, W. Va.
J. E. Freeland, N. C.	J. E. Rutledge, S. C.
B. D. Friedenwald, Md.	W. J. Selby, Md.
A. H. Goodwin, N. B.	E. O. Sims, Fla.
F. M. Hampton, Ala.	F. E. Smith, Conn.
W. M. Hargrave, N. C.	D. T. Smithwick, N. C.
J. H. Harrington, Ky.	A. B. Soule, Vt.
C. A. Hews, Me.	W. H. Spangler, Md.
W. E. Holt, N. Y.	W. M. Spaulding, Minn.
M. H. Hunter, N. C.	W. Sproul, Can.
W. G. Jankens, Va.	H. M. Staire, Cal.
L. D. Kelley, Md.	R. W. Steuart, Ind.
R. L. Lamar, Ga.	F. C. Street, Md.
J. H. London, N. C.	A. G. Strickler, Pa.
T. M. Lynn, Ia.	J. C. Sutherland, Md.
W. H. Mathews, N. J.	A. Viets, N. S.
H. C. McBair, N. Y.	E. H. Webb, S. C.
F. L. McGraw, N. Y.	E. T. White, N. Z.
W. L. Minson, Ga.	J. F. Wilson, S. C.
C. W. Minton, Pa.	U. V. Withee, Me.

#### INDIANA DENTAL COLLEGE.

The Eleventh Annual Commencement of the Indiana Dental College took place Thursday evening, March 6, 1890, at Plymouth Auditorium, Indianapolis, Ind. This is the most prosperous year the College has enjoyed, there being eighty-three students in attendance. The annual address was delivered by Dr. J. R. Clayton, of Shelbyville, Ind., entitled "The Role of Dentistry in Civilization."

The following named (24) gentlemen received the degree of Doctor of Dental Surgery :

E. H. Keeth.	I. N. Sheppard.
B. W. Jones.	G. W. Thompson.
E. G. Fry.	W. L. Levis.
A. H. Brown.	T. E. Coffin.
J. H. Hess.	Morris Coffin.
C. A. Rowand.	N. F. Hazlett.
H. B. Tucker.	F. B. Gonzales.
H. L. Connican.	B. Brimacombe.
W. W. Munger.	L. A. Cox.
R. B. Gentle.	T. H. Davidson.
B. W. Sober.	C. E. Ervin.
E. D. Bailey.	G. E. Hunt.

## VANDERBILT UNIVERSITY—DEPARTMENT OF DENTISTRY.

The annual commencement exercises of the Department of Dentistry, of Vanderbilt University, were held in Watkin's Hall, February 25, 1890. The valedictory on the part of the class was delivered by F. U. Meadows, of Louisiana, and the charge to the class by Prof. W. H. Morgan. The number of matriculates for the session was 101. The degree of Doctor of Dental Surgery was conferred on the following (41) gentlemen by Chancellor L. C. Garland, LL. D.

Allen E. Frazier, N. C.  
T. W. Robson, Texas.  
James E. Dugger, La.  
Hiram H. T. Segrest, Miss.  
Louie B. Torrence, Mo.  
William C. Houston, N. C.  
Charles C. Herman, Ind.  
John L. Fox, N. Y.  
Ebb J. Harrison, La.  
Charles N. Folse, La.  
Thomas W. Smith, Jr., Texas.  
Eugene J. Tucker, N. C.  
Frederick U. Meadows, La.  
A. P. Brown, Ala.  
Norris C. Leonard, Tenn.  
Cole. L. Gillespie, Tenn.  
John E. Andrews, Ark.  
Cornelius S. Shields, Ala.  
Thomas M. Stowers, Miss.  
James C. Montgomery, Ky.  
W. H. Stokes, Miss.

Julius L. Howard, Cal.  
James W. Jones, Ala.  
John W. Peden, Jr., Tenn.  
John C. Pearson, Ala.  
Earnest L. Hestle, Ala.  
John W. Combs, Texas.  
William H. Guess, Miss.  
Crockett Campbell, La.  
Louis V. Hightower, Ala.  
Delevan F. Bentley, N. Y.  
F. C. Johnson, Tenn.  
Felix M. Gillespie, Ala.  
Dan F. Robinson, Ala.  
Arthur H. Douglas, Mich.  
Charles H. Taylor, Tenn.  
Robert P. Anderson, N. C.  
William F. Price, Va.  
Francis W. Smith, Mich.  
W. D. Anderson, Miss.  
J. H. Downie, Mich.

## UNIVERSITY OF DENVER—DENTAL DEPARTMENT.

The Second Annual Commencement Exercises of the Medico-Dental Department of the University of Denver took place at the Trinity M. E. Church, Thursday evening, April 17, 1890. The annual address was delivered by Rev. Dean Hart, the faculty address by Dr. J. C. Davis, Dean of the Medical Department. The number of matriculates in the Dental Department was fourteen.

The degree of Doctor of Dental Surgery was conferred on the following (11) graduates by Rev. A. B. Hyde, D. D., Chancellor of the University :

Kate De P. Moylle, Colo.  
Laurence O'Neil, Cal.  
Frank A. Rexford, Colo.  
James E. Shoemaker, Colo.  
Sarah May Townsend, Colo.  
Isaac B. McGirk, Colo.

Otto T. Prey, Colo.  
J. Allen Smith, Colo.  
Henry E. Smith, Colo.  
Herbert S. Reynolds, Colo.  
Alva H. Sawins, Colo.

## UNIVERSITY DENTAL COLLEGE.

## DENTAL DEPARTMENT OF THE NORTHWESTERN UNIVERSITY, CHICAGO.

The first annual graduating exercises of the University Dental College, (dental department) of the Northwestern University of Chicago were held in connection with the Medical Department, at Central Music Hall, on April 29, 1890.

The following named (10) gentlemen received the degree of Doctor of Dental Surgery :

Isaac A. Freeman, Ill.  
Arthur E. Matteson, Ill.  
John B. Palmer, Maine.  
Chas. W. Richardson, Wis.  
Wm. C. Wise, Ill.

Samuel H. Hunt, Ill.  
Wm. B. McCord, Ill.  
Lucius E. Richardson, Ohio.  
Wm. O. Vallette, Ill.  
Sylvester M. Wilkie, Ill.



## MEMORANDA.

"Colleges for revenue only" is the proper thing now.

Dr. J. H. Martindale paid a flying visit to Chicago in April.

Sodium Fluosilicate  $2\text{NaF}$ ,  $\text{Si}$ ,  $\text{F}_4$ ; solubility in water 1 to 155. Non-coagulant.

We regret to learn of the sudden death of Mr. E. Stover, father of Dr. F. G. Stover, of Lanark, Illinois.

Do not forget to check off the date of the meeting of the Southern Dental Association at Atlanta, Tuesday, July 15, 1890.

Dr. J. Hardman, of Muscatine, one of the pioneer members of the Iowa State Dental Society, died quite suddenly at his home on Thursday afternoon, May 8.

Catching's Compend is progressing from month to month, and we await the appearance of Volume 1. Price, \$2.50. Send in your orders to the editor, Atlanta, Ga.

Dr. J. D. Patterson, the editor of the *Western Dental Journal*, has gone to Europe. He sailed on the Teutonic, April 30, but will return in time for the A. D. A. meeting at Excelsior Springs, the first Tuesday in August.

New York and Philadelphia, not to mention New Orleans, San Francisco, Washington and other large cities, appear to have been lost sight of in officering the section on Diseases of the Teeth, for the United States, at Berlin.

The fourth annual meeting of the Colorado State Dental Association will be held in Denver, June 3d to 5th, 1890. A cordial invitation is extended to the profession to be present.

CHAS. F. DODGE, Cor. Sec.

United States Dental College, at Chicago; to give instructions in dental surgery; capital stock, \$25,000; incorporators, W. H. Prittie, H. J. Reynolds and J. D. Robertson.

What! another?

The exhaustive article of Dr. Betty seems to be thoroughly appreciated, a number of subscribers having already expressed their approval by writing to the author, as well as to the editor. In this connection it may be worth while to remark that your perusal of the tables will convince you of the great labor and painstaking of the author in his work. Papers of this kind may not be "practical," but they make history for posterity.

A new dental college or two will soon be started in Kansas City. One on the "Original Jacobs" plan, and the other with a medical attachment, to be located at Topeka. The fever seems to have struck our Western brethren *real* hard. Seriously, unless the new aspirants for public favor will be able to improve on the present dental colleges of the West by offering increased facilities for study and practical work, there is no necessity for their establishment.

The following communication has been issued by Section VI of the American Dental Association:

NO. 128 GARFIELD PLACE, CINCINNATI, April 22, 1890.

DEAR DOCTOR—You are respectfully reminded that the work of Section VI, A. D. A. is to be done by the individual members of the Section; hence, there is confidently expected from you a personal participation in the preparation of the

report to be made to the Association at Excelsior Springs next August. It is hoped, therefore, that you already have in hand a paper, or at least have collected from current literature data that will add interest to the report, but if not, there is yet time for the performance of that duty.

Suggestions relative to any phase of our section work will be gladly received by

Yours truly,

W. S. How, Sec'y.

H. A. SMITH, Chairman Section VI.

BROOKLYN, N. Y., April 2, 1890.

*To the Editor of the DENTAL REVIEW:*

DEAR SIR:—At a meeting of the Brooklyn Dental Society, held on Monday, March 24th, 1890, the following resolution was offered and adopted:

RESOLVED, That a copy of the last section of the report of the Chairman of the Clinic Committee, relative to the chloride of methyl spray, be forwarded to each of the dental journals, with the request that they publish the same. In consideration of which, I herewith enclose a copy of said section, and sincerely trust you will give it space in your journal. Very truly yours,

LOUIS SHAW, Sec.

"At a stated clinic of the Brooklyn Dental Society, held at 444 Fulton Street, Brooklyn, on Monday, March 24, 1890, Dr. M. L. Rhein repeated his clinic with chloride of methyl, and satisfied all present that he has suggested the most efficient and painless anæsthetic for sensitive dentine yet introduced. It is undoubtedly better than the spray from a nitrous-oxide cylinder, which was described and demonstrated recently before the Odontological Society, in New York. Your committee thinks this agent of so much consequence to us, and the method such a boon to suffering humanity, that it suggests that a copy of this part of the report be sent to all the leading journals, that the matter may be brought to the attention of the profession in a prominent way, immediately.

It has been previously demonstrated that dehydration produces anæsthesia in dentine, and that sprays have this effect. But all sprays, except this, produce considerable pain. The chloride of methyl spray acts so instantaneously that the pain is only a momentary shock at most, and is not complained of by the patients. It may seem that this is a strong report from your committee, but since the last clinic your committee has thoroughly investigated this method and seen it satisfactorily demonstrated in a large number of cases."

#### WISCONSIN STATE DENTAL SOCIETY.

The twentieth annual session of the Wisconsin State Dental Society will convene at Appleton, Wis., July 15th, continuing three days. All dentists in the State are urged to attend. Visiting dentists are always welcome.

C. A. SOUTHWELL, *Secretary*.

#### INTERNATIONAL MEDICAL CONGRESS.

Section XIV.—Diseases of the Teeth.—Partial Programme: The work in the forenoons will consist of practical demonstrations in the Dental Institute, and afternoons to the discussion of papers. 1.—Narcosis with Bromide of Ethyl. 2.—Pyorrhœa Alveolaris. 3.—Micro-Organisms and Decay of the Teeth. 4.—Crown and Bridge-Work. 5.—Bonwill Method of Articulation; Sectional Secretary, Bush. 6.—Alexander-ufer, Berlin, N. W.

## PROGRAMME CHICAGO DENTAL CLUB FOR 1890-91.

1890. May: Dr. E. J. Perry—"Dental Prosthesis." June: Dr. I. B. Crissman—"Fallacies of Bridge Work." September: Dr. L. P. Haskell—"Retention of Artificial Dentures." October: Dr. M. Eugene Norton—"Subject to be announced." November: Dr. E. S. Talbot—"How Should Dental Societies be Governed?" December: Dr. C. E. Bentley—"Some Impressions a Young Man Receives upon Entering the Profession."

1891. January: Dr. A. E. Matteson—President's Address; annual meeting. February: Dr. J. E. Hancock—"The Development of Dental Science." March: Dr. C. R. Baker—"Metals for Filling." April: Dr. J. H. Woolley—"Subject to be announced." May: Dr. I. A. Freeman—"Salivary Calculus." June: Dr. C. F. Hartt—"Root Filling."

## MISSOURI STATE DENTAL ASSOCIATION.

MEXICO, Mo., March 15, 1890.

*To the Editor:*

We wish to call your attention to the next meeting of the Missouri State Dental Association, which will be held at Pertle Springs, July 8, 9, 10, 11, 1890. No effort will be spared to make this meeting one of the largest and most interesting in the history of the Association. The American Dental Association will meet in Missouri next August, and it is especially desirable that we have a large attendance at our next meeting, so that we may make proper arrangements to receive the members of the American Dental Association in a manner that will reflect credit upon the dentists of Missouri. Now is the time to make your plans so that you may be able to be with us, and we earnestly solicit your presence.

Fraternally yours,

J. F. MCWILLIAMS,

W. L. REED,

W. H. BUCKLEY,

*Executive Committee.*

A FEMALE DENTIST—SHE GOES FROM HOUSE TO HOUSE ATTENDING TO  
WOMEN AND CHILDREN.

A Madison avenue dentist employs a lady assistant at a salary of \$50 a week and a commission for every customer, who goes from house to house and cleans teeth, says the *New York World*. This itinerant is young and pretty, attractively dressed, and while self-assertive, she is a lady in all that the name implies. She has taken a course of medical dentistry, and she knows enough about the work to cap a nerve, sooth a violent toothache, put a temporary filling in a cavity requiring immediate attention, remove a child's tooth and insert wedges to loosen the little molars and incisors that need straightening. In a hand-satchel she carries material for that purpose, besides a supply of drugs, pumice stone and the like for cleaning the teeth. Ordinarily she charges 50 cents to put a set of molars in order, but the mouths of a small family are looked into for a couple of dollars. Without mentioning the dentist employing her, she is perfectly honest in advising work where it is needed, and the very modesty of her tactics secures a trade that an audacious method would never reach. Observation of the courtesies of the profession prevents her from passing judgment on the gilding in fashionable mouths. It is needless to mention that the scheme is a profitable one. The refusal of the young lady to examine into the masculine mouth gives her a standing in the family that less discrimination would deny her.



## CHICAGO DENTAL SOCIETY.

Programme of scientific work for the season of 1890-1891.

May 6--Dr. D. M. Cattell, "Anomalies of Pulp Canals." Dr. Electus B. Ward, "Who Shall Decide?"

June 3--Dr. H. A. Costner, "Root Filling." Dr. E. Noyes, "Immediate Root Filling."

July 1--Dr. A. W. Harlan, "Dental Societies;" their Functions and Methods of Management; Incidents of Office Practice.

October 7--Dr. J. Austin Dunn, "Salivary Calculus;" Incidents of Office Practice.

November 4--Dr. I. A. Freeman, "Preparation and Filling of Proximal Cavities and Protection of Lateral and Cervical Margins." Dr. L. Ottofy, "Rubber Dam."

December 2--Dr. L. L. Davis, "Histology and Microscopy;" Incidents of Office Practice.

January 6--Dr. C. R. Baker, "Metals." Dr. J. J. Whaley, "Bridge-work."

February 3--Drs. J. E. Hinkins and O. D. Swain, "The Care and Treatment of Deciduous Teeth."

March 3--Dr. E. M. S. Fernandez, "Crowns." Incidents of Office Practice.

April 7--Dr. C. N. Johnson. President's Annual Address. Annual Meeting.

Note.--At each meeting, whenever time will permit, incidents of office practice will be discussed. Members are especially invited to bring new instruments or appliances for exhibition.

## KANSAS STATE DENTAL ASSOCIATION.

The Nineteenth Annual meeting was held at Topeka, Kan., April 29th to May 2d. It was well attended and was one of the best meetings ever held by the association. Dr. H. W. Parsons, of Wamego, Kan., delivered the annual address. Drs. Schriver, of Red Oak, Ia., W. N. Morrison, of St. Louis, Mo., and Dr. Southworth, of Sacramento, Cal., were elected honorary members. The following clinics were given:

Dr. R. Matthews, Wichita--Putting on rubber dam.

Dr. E. A. Floyd, Kansas City, Mo., exhibited casts of a fracture of superior maxillary and showing treatment. Also showing some new forms of artificial teeth.

Dr. J. G. Hollingsworth, Platte City, Mo., demonstrated his method of forming a perfect joint between band and porcelain front and mounted a gold and porcelain crown.

Dr. A. J. McDonald, Kansas City, Mo.--Cohesive gold filling with hand mallet.

Dr. F. O. Hetrick--Filling very sensitive cavities, demonstrating the use of electricity to obtund pain.

Dr. E. M. Lavine, of Kansas City, Mo., showed bridge of left superior lateral incisor mounted on palatine surface running to cutting edge, supporting central incisor impinged by a bar into root of cuspid.

Dr. G. P. Ashton, Topeka, Kan., showed building down central incisor with gold, using anchor screws, the electric engine and Bonwill mechanical mallet.

Dr. F. O. Hetrick filled some very sensitive cavities in teeth, using electricity to obtund the pain, and the operation was quite painless. A cavity not so bad

was filled with the use of the ordinary methods of drying, etc., instead of electricity, and it was very painful. He uses an electrode in each hand, the negative wire being divided and a wire put around the tooth besides.

Dr. D. J. McMillan, of Kansas City, Mo., did some difficult bridging with soft gold, connecting teeth with two porcelain crowns intervening, making four crowns in one piece.

Drs. L. A. Matthews and T. K. Aitken demonstrated baking plain and gum porcelain teeth and curving blocks.

Dr. L. M. Mathews, of Lawrence, showed a new mechanical blow-pipe, a combination crown pliers and a right-angle attachment for mechanical mallet.

Papers were read as follows: Dr. H. S. Lowry, of Kansas City, Mo., read a paper on cocaine. The discussion was opened by Dr. A. H. Thompson.

Dr. J. W. Heckler, Kansas City, Mo., read a descriptive paper on bridge work, giving a minute and comprehensive description. Discussion was opened by Dr. H. W. Shriver, Red Oak, Iowa.

Dr. E. A. Floyd, of Paola, gave a paper on "Our Calling, Dentistry." Discussion was opened by Dr. R. Mathews, of Wichita.

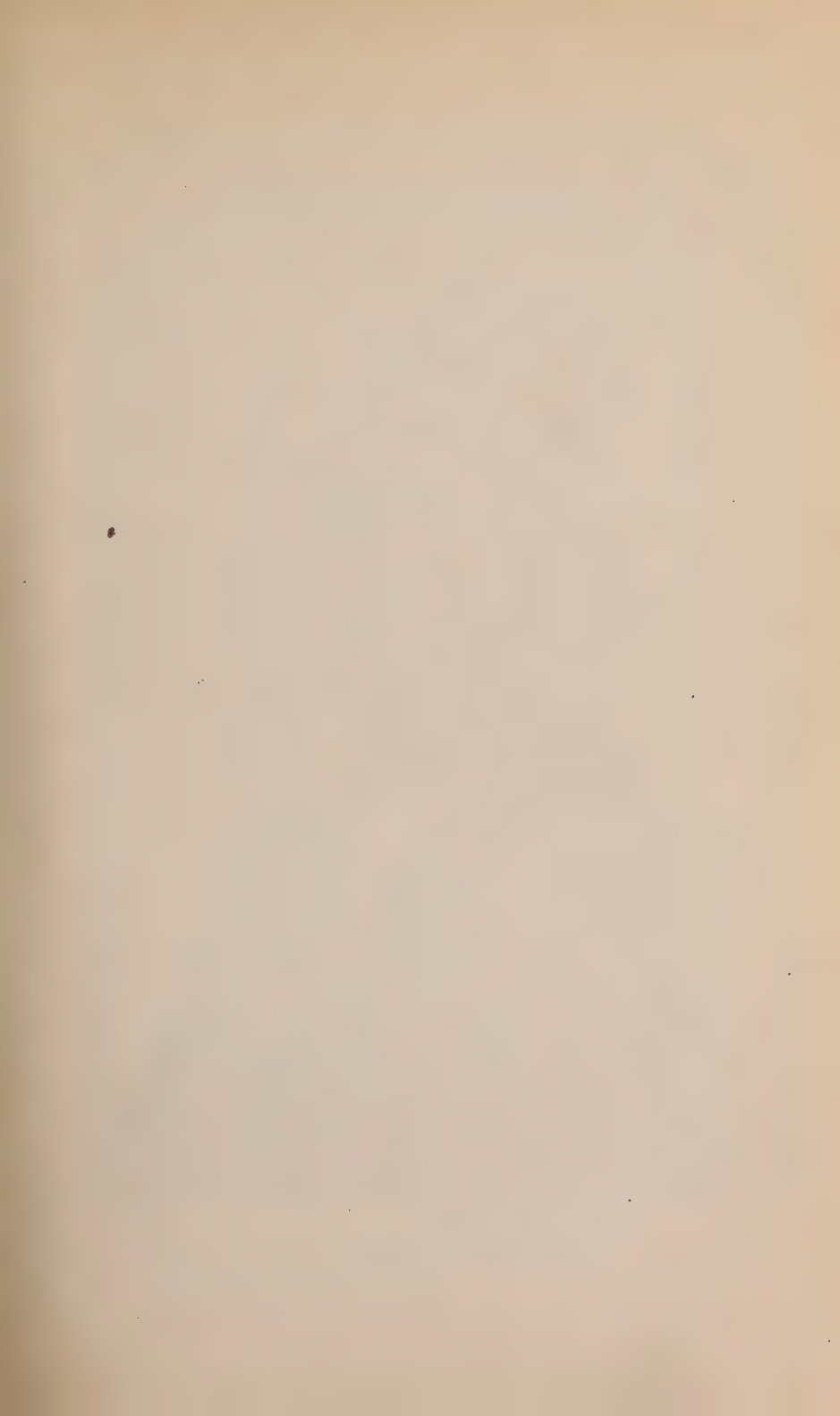
Dr. J. J. Reed, Chanute, Kan. Subject: "An Index for Our Periodical Literature." Discussion opened by Dr. A. M. Callahan.

Dr. E. J. Husband, McPherson, Kan. Subject: "Copper Amalgam." Discussion opened by Dr. C. E. Esterly, Lawrence, Kan.

The following officers were elected for the coming year: President, Dr. T. K. Aitken, Valley Falls; first vice-president, Dr. F. O. Hetrick, Ottawa; second vice-president, Dr. J. A. Roberts, Sabetha; treasurer, Dr. R. A. Wasson, Ottawa; secretary, Dr. C. E. Esterly, Lawrence; member of board of censors, Dr. S. S. Noble, of Wichita. The Association adjourned to meet next year at Wichita.

#### MR. GLADSTONE ON THE FORTUNES MADE BY MEDICAL MEN.

At the opening of the new Medical College Building in connection with Guy's Hospital, Mr. Gladstone made an address in which he referred, among other things, to the late Sir William Gull, and said: "I am delighted when I hear of the creation of great fortunes in this country that are not merely commercial. It is an excellent thing that large fortunes are made in commerce, by the handling of money, by the supply of the country with material goods; but it is desirable that their power and influence should be qualified by the creation of other fortunes, such as now, almost for the first time, we find beginning to be created by medical men. I rejoice to think that the medical man, who spends his talent and strength as freely in the performance of his duty as any member of any other profession, will be able to make a competent and even large provision for his family. Another point upon which I congratulate the profession is its independence. It does not rely on endowment, but on its own exertions directed to meet human wants. There is no great profession which has so little to say to the public purse, and which so moderately and modestly dips its hand into that purse. It is not only in the interest of the public, but of the profession itself, that it is eminently self-supporting; and, rely upon it, that that principle of self-support does much to maintain its honor and independence and to enable it to pursue its stately march in the times that have come and in the times that are coming, to form its own convictions, to act on its own principles without fear or favor, for the general benefit of mankind."—*Medical Record*.







James W. Green  
H. J. L. L.

# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, JUNE 15, 1890.

No. 6.

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## ORIGINAL COMMUNICATIONS.

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### GUTTA-PERCHA.\*

BY EDGAR D. SWAIN, D. D. S., CHICAGO, ILL.

Gutta-Percha is the concrete juice of a tree known in botany as the Isonandra Percha or Taban Tree. The tree belongs to the natural order Sapotacea, Sub-class Corollifloral, and attains a growth of from 2 to 3 feet in diameter, with a height of from 60 to 70 feet. The trunk is straight, the leaves alternate on the limbs and branches, their upper surface of a pale green, and their under is covered with a short, reddish-brown hair. The flowers are axillary from one to three in the axils, supported on short curved pedicles.

The wood is peculiarly soft, fibrous and spongy, pale colored, and traversed by longitudinal receptacles of reservoirs, filled with the gum, forming ebony black lines.

The tree flourishes best on alluvial tracts of land, at the base of hills, which protect and favor its growth. When gutta-percha was first produced for commercial purposes, these trees formed the principal part of the jungle, but are now much scarcer, in consequence of their wholesale destruction by the Malayan natives.

Gutta-Percha was first introduced into Europe as an article of curiosity in the form of sticks, whips, and other trifling articles, and not until about the year 1843 was it brought to the attention of scientists and manufacturers as an article of utility and value, by Sir Joze d' Almedia, a resident of Singapore on the Malay peninsula, who had observed the material in use among the natives as

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\*Read before the Odontological Society of Chicago.

handles to their knives and other utensils, as a substitute for wood or buffalo horn. He first presented specimens to the Royal Asiatic Society of England in 1843, and received their letter of acknowledgment, which would indicate that this Society either recognized its commercial value, or looked upon it as a curiosity of no small importance.

About this time William Montgomerie, a Scotchman who had been for some years Assistant Surgeon to the Residency at Singapore, also called the attention of scientists and manufacturers of London to the article, and many of the uses it could be put to, and was really the first to exert himself to bring it into general use.

The valuable qualities of the substance were no sooner publicly announced than it came into general use. Its singular adaptation to a great variety of purposes was quickly recognized and an extensive demand for it sprang up almost immediately, which I cannot illustrate better than quoting from authority the rapid and almost unparalleled increase in its importation into Europe, principally England :

In 1844	the import into Europe was	200 pounds.
" 1845	" " " "	22,477 "
" 1846	" " " "	713,368 "
" 1847	" " " "	1,236,368 "
" 1848	" " " "	2,496,000 "

and into the United States in the latter year 122,626 pounds.

This increase in production was more than equalled by the increase in price, as in 1854 the price per ton was \$21.25 ; in 1862 it had run to \$53 per ton, while in 1877 it readily brought \$1.25 per pound or \$2,500 per ton.

The knowledge of increasing demand and value soon spread from Singapore to the countries around the Gulf of Siam, Bay of Bengal and China Sea, stirring the anxiety of the gatherers. This eager demand for the now-valuable gum, animated by the thirst for immediate gain, was productive of a reckless destruction of the trees which produced it, which, in place of being simply tapped, were felled to the ground, stripped of their bark and the milky juice collected. Not more than 20 to 30 pounds from each tree could be secured by this procedure, and it is estimated that in three years at least 270,000 trees were thus destroyed. About this time an English company with large capital was formed which secured by sale and lease the remaining forests and commenced collecting the



gum by tapping instead of felling the trees, thus securing to themselves a profitable investment, as well as preventing an otherwise inevitable failure in the supply of this material.

Chemically, gutta-percha is a hydrocarbon, in its natural state nearly white, tough, and inelastic; heated to about  $50^{\circ}$  to  $70^{\circ}$  C. it becomes capable of being moulded into any required shape, and it is this quality which makes it so valuable in the arts. It is found, upon analysis, to be composed of three constituents known as gutta, albane, fluavile, in proportions of 78, 16, 6.

Gutta is completely insoluble in water or any kind of saline solution, fermented liquors, dilute acids, or strong alkalies.

Concentrated nitric and sulphuric acids attack it, the former with comparative rapidity, accompanied by effervescence, the result being a brownish, doughy mass, which subsequently hardens into a friable and nearly worthless compound. Sulphuric acid acts more gradually, but eventually disintegrates it, at the same time being itself decomposed with evolution of sulphurous acid. The formula of gutta is precisely like that of pure caoutchouc,  $C^{10}$ ,  $H^{16}$ .

Chloroform and carbon disulphide are its best solvents.

Albane is a white pulverulent mass, soluble in turpentine, benzol, carbon disulphide, ether, chloroform or boiling alcohol; melts at  $100^{\circ}$  C., is perfectly fluid at  $175^{\circ}$  C., and contracts greatly on cooling.

Fluavile is yellow and resinous, dissolved by the same solvents, differing only in that it is soluble in cold alcohol, becomes paste at  $50^{\circ}$  C., completely liquifies at  $100^{\circ}$  to  $110^{\circ}$ , and at a higher temperature boils and decomposes.

Gutta-percha is a poor conductor of both heat and electricity. It becomes negatively electric upon application of friction, and was first proposed for an insulator by Faraday, when perfect insulation became necessary that submarine cables might be made useful. Besides this property it was found to possess another equally important—that of indestructibility by water, fresh or salt. It is reported that sections of the first marine cable, laid in 1857, which have been continuously under salt water, are in almost as good condition now as when first laid.

The crude gutta-percha of commerce contains many impurities, some of which are designedly introduced for the purpose of gain in weight, and as their removal is necessary, I will briefly give an account of the process through which it passes for its purification.

First, the crude blocks are run through a machine which reduces them to slices, these in turn are run through another machine which reduces it to small fragments ; that is called "tearing," the fragments falling into vats of cold water, the gutta-percha floating while the sand and other heavier impurities fall to the bottom. The floating material is by an endless band conveyed to another tearing machine, where the same process is gone through ; this is repeated as many times as necessary, when the floating material is passed through a series of rollers, for the purpose of consolidation. It is then conveyed to vats of water, and steam admitted for the purpose of softening, and when in a semi-fluid mass is agitated, until the greater part of the grosser materials are removed. Thence it is taken to a machine called a "teaser," which consists of an iron driver lined with crooked priggged teeth ; inside revolves a cylinder also covered with teeth, revolving at a speed of 800 revolutions per minute ; in fact, this is on the principle of a threshing machine ; here the material is again torn into shreds and falls into another vat of water, where the impurities fall to the bottom and the purified material is now transferred to the kneader or masticator, which is a strong iron driver with a fluted inside surface, in which revolves a cylinder with heavy cogs, the whole being heated by steam ; here it is kept heated and kneaded until it is worked into a homogeneous mass, all air and water being expelled. It is now fit for the market and hands of the artisans, who wish to work it into the various articles for which it is adapted.

Gutta-percha, like most other materials, is liable to adulteration. This is mostly done by mixing with it a substance of similar properties, called getah ; like gutta-percha, it is the product of a tree, is of a grayish color, clammy to the touch, and brittle, and greatly deteriorates the value of the true gum.

Almost immediately after the attention of the world had been called to the properties of gutta percha, observing minds in the dental profession thought they saw in it a valuable acquisition, and commenced experimenting with it, and now it is almost a necessity with us as a filling material and valuable adjunct to the mechanical department.

For our use it is necessary that it be still further refined.

Prof. Flagg informs us that he accomplishes this by hard work, kneading upon a plain iron slab to which is attached a handle carrying a wedge-shaped lug, both pieces polished and nickel-plated

to give a smooth and somewhat greasy surface, the slab of course being kept warm enough to keep the material sufficiently plastic to admit of working. The other materials to be added are kneaded into it until a perfectly homogeneous mass is obtained. He informs us that five or six ounces per day is all that can be prepared by one man.

I am under obligations to L. D. Caulk, manufacturer, with whose gutta-percha materials you are all acquainted, for information upon the subject of the properties and methods of preparation. He says, "I use the purest gutta-percha obtainable, and it is then selected with great care, then kneaded by a special apparatus prepared expressly for its manipulation; the greatest care being necessary to obtain and maintain the proper temperature; with too small an amount of heat it is impossible to knead, and incorporate with it the inorganic materials used, while too much heat easily ruins the entire batch."

Those of you who have used his preparations can testify to the uniform results obtained by him. His Diamond Point Stopping certainly excels all others in those hard and tough resisting qualities so necessary for anything approaching permanent work, while his points for root-filling are hard and sufficiently stiff to be carried successfully home in the filling of root canals.

Gutta-percha in its purity would not answer the purpose of the dental practitioner, and is therefore made harder or softer by the admixture of oxide and sulphide of zinc, aluminum, whiting, precipitated chalk, lime and silex. For the filling materials the oxide and sulphide of zinc are the most commonly used; different manufacturers having their own formulæ which are strenuously guarded lest the "other fellow" be able to produce a close imitation of his particular brand.

A preparation known as "Hill's Stopping," was among the oldest and best known forms of gutta-percha offered the practitioner of dentistry as a filling material, and everything in the market now goes as Hill's Stopping, while it is more than likely that there has not been an ounce of the genuine material on the market in twenty-five years. Dr. Flagg in his article upon this subject printed in the *Cosmos* for May, 1888, says that it is not known of what Hill's Stopping was composed, and takes Dr. Mitchell, of Chicago, to task for the statement in his *Dental Chemistry* that it was composed of gutta-percha, quicklime and silex. Dr. Flagg did not stop to con-



sider that Dr. Mitchell was not a dentist, and that his information was received from practitioners of dentistry, dealers in dental goods and perhaps, by analysis of goods now on the market, all of which go by that name.

That gutta-percha has some good qualities as a material for filling carious cavities in teeth is an undisputed fact. The qualities especially recommending it are its non-conducting and non-irritating properties, both of caloric and electricity. Its objectionable qualities are, being too soft to resist the wear and tear of mastication and its contractibility. One peculiarity connected with the latter property, however, is that the leaky condition does not always conduce to further decay. Dr. Flagg gives no theory to account for this. Dr. Caulk believes that sulphur is the preserving property. I therefore conclude that his preparations contain a certain amount of this article. A serious objection, however, is the stained or clouded appearance so common from this leaky condition, especially when used in the anterior teeth.

As to its uses for pulp capping there is a variety of opinions. It would seem that its non-conductivity should recommend it highly for this purpose. The American System of Dentistry teaches, and not without reason, that it is a very poor material for this purpose, from the fact that when exposed a long time to moisture it is liable to soften and expand, thereby producing undue pressure. My own opinion is that this is not the true cause of the failure, but, instead, the objections lay in its porosity; continued exposure to the fluids exuded by the pulp decompose its surface, its pores are filled with them, their decomposition takes place, septic poisons are formed, and the pulp is by them destroyed.

As a root filling, it is my opinion, and that generally accepted by the profession of the present day, that it has no equal. Gutta-percha dissolved in chloroform, formerly known as traumaticine, now as chloro-percha, may be forced into the remotest part of the finest pulp canals, when they have been perfectly dried, and where this semi-liquid is not deemed sufficient, as in the larger canals, cones of the same material in size and form to approximate the canals may be forced into them, thus expanding and forcing the liquid, laterally making their stoppage almost complete, the foramen being so small that little or no danger occurs from contact with outside fluids.

When gutta-percha is used as a stopping for carious cavities, great care is necessary to secure the best results; the carious portions removed, leaving, where practicable, all healthy overhanging enamel, that as little of the filling material be exposed to wear as possible. The rubber-dam adjusted, the cavity antiseptically treated, the gutta-percha prepared in small pellets, carefully softened over a water bath to prevent over-heating and carefully packed with small, pointed pluggers or condensers, surplus removed either with very sharp trimmers or with instruments slightly oiled to prevent drawing the material from the margin of the cavity. Mixed with wax to reduce its melting point, it makes a valuable compound with which medicaments may be confined in carious cavities.

I desire here to call your attention to some experiments being made by one of our own number, Dr. Ames. He furnished me some time since with a sample of his preparation for use in deciduous teeth; it is a combination of pure copper and gutta-percha. As he is present himself, I will not take his speech from his mouth by giving its virtues, or telling you what he has accomplished. In the laboratory it is invaluable for the construction of base plates, models for obturators and other things requiring an unchanging, durable pattern to work from; as a material for impression taking, it is not yet perfection; its hardness disturbs the parts too much, and its contractive qualities leave one very much in doubt as to the correctness of the model procured.

Many years ago an effort was made to produce a substitute for vulcanizable caoutchouc, by incorporating iodine and sulphur with gutta-percha. It was not sufficiently successful to materially affect the income of the Goodyear Dental Vulcanite Company.

Prof. Flagg, the High Priest of the "New Departure" theories, asserts that "Just in proportion as a tooth needs saving gold is the worst material that can be used," and while he does not say it in so many words, leaves us to understand that gutta-percha is the best material that can be used. While I cannot fully agree with him, I must confess that were the profession to use more gutta-percha, use it with care, and put proportionately the same amount of brain work into the filling that is used with gold, our patients and ourselves would be the gainers thereby, and many teeth be made useful that are now sacrificed to the destructive and deforming practices of the forceps, and the unsightly display of gold bands and brazen crowns will be abrogated to innocuous desuetude.

SOME OF THE PRINCIPLES TO BE CONSIDERED IN THE TREATMENT  
OF IRREGULARITIES OF THE TEETH AND FRACTURES  
OF THE MAXILLARY BONES.\*

BY E. H. ANGLE, D. D. S., MINNEAPOLIS, MINN.

The importance of a correct appreciation of that branch of our profession known as Orthodontia is, I am glad to believe, becoming better appreciated.

In the past ten years more has been added to our knowledge, both as to causes and treatment, than in all former times combined. And yet how far we are from a full and well-rounded knowledge and appreciation of the subject in all its bearings. Every one who has given the subject any considerable thought, must admit, and I think I can safely say, the knowledge of this branch possessed by the average dentist, is far below that upon any one subject pertaining to our profession.

There are a number of reasons for this :

First: The difficulties in the way of obtaining correct knowledge of this subject are very great indeed. I do not hesitate to say, after careful thought and much experience, extending over a period of fifteen years, that throughout the entire realm of surgery, no branch comprises such a number of difficulties to be overcome, both in the mastery of causes, and the obstacles in the way of treatment, as Orthodontia. As proof of this, I have only to point to you the hundreds, and even thousands of surgeons throughout the country, who are continually doing creditable, and many of them brilliantly successful operations, and in operative dentistry proper it has grown to be the rule, instead of exception, to find excellent, even brilliant operators everywhere. But in Orthodontia while the number of cases which would receive attention are greater than in any one branch of general surgery, yet we can easily count upon our fingers (even then use but one hand,) the number of operators who have obtained results entitling them to be regarded as really successful. The cause of this is obvious. No dentist who has anything like a full practice, can give the time and attention necessary to experiment—and master the difficulties of this branch, especially with the present methods of treatment—and prices commonly received for this work. I am fully convinced,

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\* Read before the Nebraska Dental Society, Omaha.



after much experience and observation, that not until Orthodontia is studied and practiced as a separate and distinct branch of dentistry, will, or can it ever, obtain the success it deserves. I will be glad, indeed, when dentists, who love so much to be regarded as members of a broad and liberal profession, shall *really be liberal*, and acknowledge that there is too much in dentistry for one to know it all; and to realize that careful, specialized effort will produce better results to both patient and operator, than the general rush and land-office method now so common.

There should be several specialists in orthodontia in every city and town of any size, for surely the demand is certainly great. The general practitioners should send their patients to such specialists liberally and freely, and thus would humanity be greatly benefited, and the now very common and often horrible deformities be greatly lessened. But it will be a long time before this is brought about, and probably never, until the present rotten and disgraceful method of dental education is abolished and supplanted by correct principles. In the meantime it should be the duty of every dentist to familiarize himself with all the simple and practical appliances extant, so that he may at least treat the simple cases which occur in his practice.

So much for a *general* consideration of the subject. Lack of time will prevent me from a consideration of the causes of dental irregularities, much as I should like to do so.

I must refer you to the excellent works by John Tomes Kingsley, and the recent work of Dr. Guilford or what is far better, a careful study of the comparative anatomy of the teeth, and especially, the careful history of each case with which you have to deal. In my experience in the treatment of dental irregularities, I have found that there are a few principles that should not be disregarded, and by carefully observing them, I have found my labors greatly lessened.

First: Have a clear and correct idea as to the *exact* changes you wish to accomplish before you begin the work. This is often difficult and can only be gained by a *careful study* of the case, not only from *perfect* models, but the teeth themselves together with the jaws, and especially the features of the patient.

And when I speak of models, I do not mean the kind usually employed, namely, when only the points of the teeth are imperfectly shown from a wax impression. But *perfect models*, showing not

only the exact size, shape and position of each tooth in the arch, but the course and position of the roots, as well as the roof of the mouth, gums, rugæ, etc., each cusp, rugæ or depression are land-marks so to speak, of great value as the treatment progresses.

But like all evidence to be of any value must be correct, I hope to be able to show you all an easy way of making such models, at my clinics to-morrow.

Second: Study not only to produce an even and regular arrangement of the teeth in the arch, but also aim to restore regularity of features and harmony of facial expression, together with correct occlusion of the teeth. No permanent beneficial results need be expected if we have not succeeded in gaining proper occlusion. Mal-occlusion will produce mal-position. This is well illustrated by the almost daily observance of the effects of the damnable practice of extracting the first molars.

Third: In designing an appliance for a given case, study to accomplish two things. First, try to construct an appliance which will inconvenience the patient the least possible amount. Second, an appliance which shall be as efficient as possible. A long list of other virtues to be sought is laid down in all your text books. But you will consider well the two I have mentioned and you will see *how much* hinges on them and how little their use is needed.

Fourth: Observe the greatest care and accuracy in the making and fitting of your appliances. Throughout all dentistry no piece of our work is subjected to so severe a test as the regulating appliance. Therefore you will save much valuable time by constructing it well.

Fifth: Observe the greatest system in the treatment of your cases. See them regularly and carefully note the changes.

Sixth: The question of anchorage is of the greatest importance in designing an appliance; you cannot consider it too carefully; but of this I shall speak more fully later on.

Seventh: No appliance should ever be used that necessitates frequent removal.

It is old fogysm, out of date, and should not be used.

Eighth and last and VERY IMPORTANT: Charge well for your work. No dentist can possibly afford to give the amount of time and thought that is necessary without being well rewarded for it, and when not paid, his interest usually lags and failure is then very near at hand. Therefore charge well, but do not charge for what

it has taken you eight months to do which should have been completed in six weeks.

I will now show you the appliances which have been so successful in my practice, and which seems to me to be founded upon correct principles. All of them you can easily make and apply after a little experience. If you do not care to make them you may soon be able to buy them, for they are soon to be placed on the market. But I do not hesitate to say any dentist should be able to make his own appliance, and I believe he who can do so will be far more successful. I shall show you at my clinic, how you can make every piece as you see them to-night.

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### IMMEDIATE ROOT-FILLING.\*

BY EDMUND NOYES, D. D. S., CHICAGO, ILL.

The necessity for making a root-filling implies disease, either in the pulp or in the tissues surrounding the apex of the root, and the variations in the character and severity of the diseases to which these parts are subject is very great. The filling of the root may follow the cure of the disease, or may anticipate it, being done with the expectation that a cure will surely follow the operation.

To claim that so wide a range of pathological conditions as we find in connection with teeth having dead or diseased pulps can invariably be treated and cured at one sitting, so as to make immediate root-filling proper in all cases, is quackish in appearance and false in fact. It is certainly true that a considerable number of cases will admit of the removal of the pulp and the cleansing and filling of the roots at one sitting with a fair degree of safety, and many others will succeed under such treatment that cannot certainly be predicted to do so beforehand.

To attempt, very briefly, to indicate some of the limitations and contra-indications to the practice of immediate root-filling, will be the purpose of this paper, taking first the cases in which the practice is safest: those in which the pulps have been devitalized by the dentist or extirpated without previous treatment, and the pulp chambers and canals preserved absolutely from septic influences. In a large proportion of these there is but little objection to filling roots at once, and in some the objection may be no more

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\* Read before the Chicago Dental Society, June 3, 1890.



important than relates to the length of the sitting required for the complete cleansing, drying and filling of perhaps three roots, one or two of which may have proved very troublesome and difficult of access. In other cases the sensitiveness and pain attending the removal of the filaments of pulp toward the end of root-canals, especially very small ones, will be such as to compel the postponement to another sitting.

I will quote, in this connection, from a letter that I have received from Dr. Black:

"I would suggest that more emphasis is due to *time* in the matter of thorough root-cleaning. It often happens that root-canals, which I thought very well cleaned, disclose considerable debris upon cotton which has laid in them for a week. Indeed, I have come to feel that I can get a root-canal *clean* with much less expenditure of time and worry, both to myself and patient, at two sittings a week or so apart, than at one sitting. A few cotton fibers placed loosely in a canal have a marked tendency to change their position, straightening here and there and forming easier curves, or forming sharper angles at some points and easier curves at others. In this way debris or remains of dead pulp tissue become ensnared in the meshes of the cotton and are brought away with it. Furthermore, shreds of pulp near the apex of the canal are loosened by the absorptive process from the living tissues and easily come away after a week, though much teasing would have been required at the first sitting. I am very decidedly of the opinion that these matters are important in those cases in which the pulp has not come out clean and whole at a single sweep of the broach, and, unfortunately, this does not occur so frequently with me as I could wish."

"I am afraid that time will show a larger proportion of abscesses after immediate root-filling than follow the more conservative method."

In other instances in which the pulps have been successfully removed to the apices, the pain attending the carrying of the filling material to the ends of the canals will be found so much greater at that time than at a subsequent sitting, as to make it worth while to postpone the operation. If we were content to stop at the first intimation of pain or sensation by the patient, this objection could of course be easily overcome, but that would mean in many instances, leaving one-third or one-half the canal nearest the apex

unfilled. In other instances, a considerable number, there will be, after removal of the pulp, such persistent bleeding or exudation of serum into the canal as to make cleansing and drying difficult or impossible. This is a more serious objection against completing the operation, and unless it can be overcome, should contra-indicate it. These considerations and others like them serve, in the case of the writer, to postpone the root-filling to a sitting subsequent to the one at which the pulp is removed, in three-fourths or more of the cases in which a living pulp has been destroyed. It is possible, however, that in the case of some practitioners these proportions may be reversed, with as good results as they could obtain in any other way, and the general statement may be made that whenever pulps have been devitalized and proper care taken to prevent sepsis, or, more generally stated, in all cases in which the root canals and the apical space are certainly known to be, at the time and previously, in an aseptic condition, the presumption is in favor of immediate filling, subject to such contra-indications as may be developed in any particular case.

The presumption runs strongly the other way in all of the very numerous cases in which the pulps are found dead when first presented for treatment, with the pulp chambers open to the ingress of the fluids of the mouth, and in most of those in which it is not found open.

The fundamental requirements for the treatment of all such cases are the removal and cleansing from the canals of all debris and decomposing material, the evacuation of pus, if any be present, and the exhibition of disinfectants or antiseptics till all pathogenic organisms have been destroyed. Those who advocate immediate root filling in almost all cases do so upon the assumption that this can be certainly accomplished at one sitting.

Theoretically, such results can hardly be expected, and clinically we find numerous exceptions to its practicability. What is equally important in relation to this practice, it is hardly ever possible to be absolutely sure that it has been accomplished except by a trial, observing the behavior of the tooth subsequently to the treatment, and inspecting it after the lapse of some time. In other words, although a large proportion of the cases now under consideration can be cured by one treatment and would succeed perfectly if immediately filled, it cannot be certainly known beforehand which will do so. It may be convenient to make three classes, and

say something of each separately. First those having suppurating, dead or putrid pulps, but with little or no peridental inflammation, and no abscess or infection beyond the apex of the root, the disease being confined within the canals of the tooth. The second class those having blind abscesses, either incipient or established, and third those having fistulous abscesses, and both the latter either with or without some territory of carious or necrosed bone in connection with the abscesses.

The first and second of these classes cannot always be readily distinguished, and it is often very unwise to be too curious on that point at the first sitting, since the contents of a foul root canal, if pushed through the foramen, even in minute quantity, are often admirably well calculated to start an abscess where none existed, or waken to acute activity a chronic one that may be quiescent. If the entrance of the delicate nerve bristle into the canal causes pain, some vitality of that portion of pulp toward the apex may be suspected, and if blood flows which can be certainly determined not to come from beyond the foramen, vitality in that portion of pulp may be safely assumed, and we may proceed with that canal as if we had just extirpated the whole pulp, only using more care to disinfect everything thoroughly, but "there is so much liability of failure to disinfect them perfectly, or of pushing poisonous material through the apex that I am afraid of them."\* Sensation in a canal without any show of blood is not so decisive, for the tissues at the apical space are sometimes very sensitive and respond even to the presence of a broach pushed forward in a fine canal.

In most instances it is far safer to confine the cleansing at the first sitting to the pulp-chamber and the larger portion of the canals, using instruments much smaller than their caliber so as certainly to avoid any piston-like action, and close them tightly or nearly so, with an abundant quantity of some diffusible and non-coagulating antiseptic. At the next sitting, after a few days, thorough cleansing of the canals can be completed with safety; but the root-filling should wait the result of another probation, this time of about a week, and if repetitions of treatment are necessary, they should not be made too often, for antiseptics and disinfectants are usually irritating, and it is often necessary to discriminate between the soreness of an incipient abscess and that caused by the medicines used.

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\* Black.



The cases of blind abscess are least frequently claimed as fit subjects for immediate filling, and in the judgment of the writer, can never be safely or wisely treated in that way unless it is desired to compel or make a fistulous or lancet opening into the abscess, and even then it is almost always best to postpone the filling. It is manifestly much more difficult to cleanse or disinfect a blind abscess through the apical foramen, which is often small, than it is if the liquid pushed through the foramen can move forward freely to find exit through a fistula. The enlargement of foramina with a drill will almost always prove injurious, and will cause the loss of more teeth than it will increase the chances of saving. The attempt to force fluids or medicines of any kind through an ordinary apical foramen so as to cleanse and disinfect a blind abscess sufficiently to be sure of immediate filling with safety, will usually prove futile, and often the only result attainable will be a change from chronic quiescence to acute activity. The best treatment for such cases is by the slow diffusion of some antiseptic, non-coagulant liquid placed in the pulp-chamber and root-canals, and the action of the volatile camphors formed from it; but this takes time, and often a long time, and makes the filling remote instead of immediate.

The last class to be considered are those having fistulas. In respect to these it is often said that if the proper medicine can be forced through the tooth till it appears upon the gum at the mouth of the fistula, they will always get well and may as well be filled at once as at any other time; but who will dare to claim that every such case *will* get well after one treatment, or that they are any more likely to with the root permanently filled than if properly cared for by a temporary filling?

The question of immediate filling will turn then, mainly, on the question as to the usefulness or otherwise of the root canals as a means of access to the abscess for purposes of treatment. We have already referred to the difficulty of cleansing a blind abscess because it has but one opening into it. If we fill the roots of a tooth having a fistulous abscess we reduce it to the same condition, only as the fistula may be a larger and more manageable opening than the apical foramen. It is true there are some cases in which the passage through the foramen is so difficult as to be practically useless, and these may as well be filled as soon as the root canals themselves can be got into proper condition for it, but in the larg-

est number of cases the canals will be found a useful channel through which to reach the abscess, even though they be so small that we must depend upon the slow diffusion already spoken of.

It must be remembered that the foramen is generally, though not always, the road through which the cause of the disease first found its way, and is the center around which it developed, and it would seem a natural inference that it should be the most suitable point of distribution for the medicines which are to cure it.

The fact that a reliable disinfectant or antiseptic has been forced through the root of a tooth till it appears at the opening of the fistula is by no means certain evidence that it has been diffused throughout the abscess so as to cleanse and disinfect every part of it. Abscesses are sometimes large, and sometimes of irregular form, and nooks and corners of them may easily escape the action of the medicine, so that suppuration is not entirely stopped and very soon becomes completely reëstablished. Again, a large abscess, even though completely cleansed so as to stop the formation of pus for a time, may become reinfected before it has time to be filled up with new tissue.

If there is much necrosis in connection with the abscess, the difficulty of complete disinfection at one sitting is greatly increased, and is, in fact, impossible. If necrosis is pronounced or considerable, the best treatment in most cases is probably by its surgical removal, but if not too extensive it appears probable that the persistent contact with some quite diffusible antiseptic may control its irritant effect upon the adjacent living tissues to such an extent that it may be gradually absorbed and replaced by sound material. The question of immediate filling of the roots is often less important in such cases, since there is likely to be freer access through the fistulas.

It seems to the writer that considerations such as these, which have been briefly mentioned, are quite sufficient to confine the practice of immediate root-filling within very narrow limits.

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#### ROOT FILLING.\*

BY H. A. COSTNER, D. D. S., CHICAGO, ILL.

Root filling is an operation upon which the dental profession is widely divided as to the best method and materials to be employed in its successful accomplishment.

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\* Read before the Chicago Dental Society, June 3, 1890.

It is not claimed that anything new or original will be offered on this important subject, as it has many times before been the theme of contention, debate, and papers before the Chicago Dental Society. It has also been discussed in all other dental societies and dental journals throughout the length and breadth of our own country and that of the civilized world for many years.

All that can be done, then, is to work over the old material and blaze out more plainly, if possible, the path leading nearest the goal of perfection in this particular. We need but take a retrospect of the past to find the dethroned monarchs of the mouth left without the hope of a future estate. Their domain was left to the ravages of decomposing agencies until all was lost.

Thanks are due to those who have pointed out the way by which this condition of things can be controverted, but it cannot be done without judgment, patience and skill.

There are times when the dentist who strives to make himself an artist in his vocation and reach the pinnacle of absolute perfection is discouraged, disappointed, misunderstood and unappreciated in his efforts to save dead, diseased, offensive and microbe-infested roots of teeth, but there is enough success awaiting honest endeavor to encourage us to work, strive and press forward to the mark of perfection which may be obtained in the most stubborn case.

By so doing we are enabled to reclaim the lost, resurrect the dead, and restore to their thrones the monarchs of the maxillaries. With joy and gladness let us hail this great achievement and admire the bands of burnished gold about their necks and exult in the congruity of their crowns of pearly white.

This is the ultimatum of dental achievement.

In order to consummate this devoutly wished-for result, it must be preceded by appropriate treatment and the employment of a suitable root-filling.

Let us consider the feasibility of the following materials commonly used for the latter purpose:

First. Cotton, which is usually saturated with a medicament or resin. It is then forced into the small canal, but in so doing, a great portion of the fluid is passed out, thereby leaving the cotton comparatively dry. In this condition it readily absorbs the secretions in the root, and sooner or later the foul emanations cause a violent ulceration.



Second. Wood, being as it is, so very fibrous, an absorbent and difficult of preparation, totally unfits it for a root filling.

Third. Cements, which are all about the same in their working properties, for this purpose, have their advocates. Many roots have been successfully filled by the use of these materials. It is forced to the extremities of the roots by pushing in and along with it points of wood, tin, gold, cotton or by the filling the cavity of decay with it while rather fluid; then with a suitable pellet of cotton held by a pair of pliers is worked on the principle of a force pump in the cavity. The objection to its use is the uncertainty of its reaching the desired point and its liability, on the other hand, of going entirely through, causing no end of trouble unless the tooth is extracted.

Fourth. Lead, which is said, by those who have used it, to possess all the virtue needful for a root filling, but as yet my experiments have not proven its superiority to other metals.

Fifth. Gutta-percha, which material is remarkably porous, for if a thin film be deposited upon a plate of glass or porcelain, from its solution in bisulphide of carbon, and examined under the microscope, it will be found full of minute pores. Yet this material is used in its various forms more extensively than any other for this purpose. Whether this porosity spoken of is present to an alarming extent in the forms in which it is used in cavities of decay and roots of teeth, is a question not so readily subscribed to as it once was. Gutta-percha rolled between two smooth surfaces until it is reduced to the desired size for a given canal, then passed into the root on a point of a suitable instrument, makes a good filling, but it is not as easily, quickly or surely done as either tin or gold suitably prepared, for you cannot be quite certain at times but that the material has lodged before reaching the point intended, and upon pressure the fine point of the instrument may pass through the somewhat soft material without carrying it home.

In experimenting with a solution of gutta-percha in chloroform, it was found that this preparation would penetrate a canal in a glass tube about one one-hundredth of an inch in diameter more readily and to a greater extent than anything examined.

It was gratifying and at the same time destructive to previous opinions to see, after placing a drop of the solution in the empty bulb of a thermometer, then moving a smooth broach up and down through it into the canal, the alacrity with which it penetrated far

beyond the reach of the instrument and bubbled out at the other end. By close observation it will be noticed breaks occur in the material. It is the same in this larger tube\* as can be seen by the aniline color showing its capacity as an absorbent.

Sixth. Tin. This valuable material has unquestioned virtues as a filling material for cavities of decay. The readiness with which it can be manipulated between the thumb and fore-finger to the size of a horsehair—if wanted—and the ease with which it can be introduced and packed into the smallest canal, and the certainty of its being far enough and not too far, places it first in the list as a filling for root canals.

Seventh. Gold. Nothing better than gold. But tin is more easily prepared, is softer, cheaper, just as durable in this place and more compatible with tooth bone.

To recapitulate. Here is a specimen of the perfection with which gold, tin, and gutta-percha can be used for this purpose. This first right superior molar has the palatine root filled with gold, the distal buccal filled with tin and the mesial buccal filled with chloro-percha.

This mesial root has a divided canal which did not appear when it was filled, but upon grinding to expose the canal, the larger branch was found perfectly filled, and the solution had backed up into the smaller one, filling that too, the aniline showing the canals plainly.

This specimen is typical of the advisability of using chloro-percha in such cases.

To sum up. Chloro-percha for the buccal roots of superior molars, mesial roots of lower molars and divided canals in bicusps and other roots when found, for the reason that in these roots the apical foramen is so small that there is no danger of forcing the solution entirely through. Tin in the larger roots for the reasons already given.

The indiscriminate practice of boring into the roots of teeth for the purpose of filling them is considered by the essayist to be useless and pernicious.

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\*The essayist exhibited a number of glass tubes filled with tin, gold and gutta-percha, also several roots of teeth filled with gold, tin and gutta-percha. In these cases the roots were filled to the apex with the metals.—[EDITOR.]

ADDRESS OF DR. F. M. SHRIVER, GLENWOOD, IOWA, BEFORE THE  
IOWA STATE DENTAL SOCIETY, AT ITS TWENTY-  
EIGHTH ANNUAL MEETING.

*Mr. President, Ladies and Gentlemen:* I little dreamed when I first entered this society that I should ever have the privilege of addressing you from the presidential chair. I consider it not only a privilege but an honor as well. An honor to be the president of a dental society that has made a record second to no State society in the Union, and an honor also to occupy a position that has been filled by so many able men who have preceded me; men who have attained eminence in our profession and whom all respect and admire—pioneers, some of them, who presided over our meetings when this society was in its infancy, and whose faithfulness and energy helped to make it what it is; and I consider the honor greater that during my term this society is in its most flourishing and prosperous condition.

It has been twenty years since I entered upon the practice of dentistry, and in choosing a subject upon which to talk, I have thought that a backward glance over those twenty years might not be uninteresting.

It has been said that the world increases in knowledge by undulations. There have been periods of great activity in all branches of science, and again, periods of marked apathy. Doubtless many things that the ancients knew have been lost in the obscurity of successive generations, and again brought to light as new facts. Other bits of knowledge have been forgotten and still remain for some enterprising investigator to dig out and earn for himself the plaudits of his fellow-men. The old saying "There is nothing new under the sun" is true as to the world and infinite time, but to finite man knowledge comes ever as a new and fresh item of information.

It seems to me dentistry in a measure illustrates this thought. There is some evidence that dentistry of some sort existed ages ago, that it made some advances and was lost. Again it flourished, and in our own time we have seen it rise and fall, and rise again. Is this not true? Let us see.

Old practitioners have told us with what struggles dentistry advanced from the rudely-carved dentures of hippopotamus ivory to porcelain teeth upon gold plates, all shaped, burned and constructed by their own hands. Think of the training and skill neces-



sary for that. If you have ever seen it, as exhibited in one of these old dentures, you cannot help but admire. They rose also from the universal use of the turn-key to fillings of soft gold that defied the ravages of decay and saved teeth for twenty and thirty years. They also removed nerves and filled roots; then there came a wave that I cannot but call retrogressive; vulcanized rubber was invented. It has been and is now a boon to humanity; but what did it do for dentistry? The skill that constructed the gold plate was lost. The cheaper base rapidly replaced the expensive but vastly better one of the old-timers, until it was rare that a gold plate was even recommended in the better-class offices, and still more rarely made, while very many dentists had neither the necessary outfit nor the skill to produce them.

Cohesive gold also produced a bad effect, for, while this material requires the highest grade of skill to produce durable and protective work, it could be made to look substantial by an incompetent, who could do nothing with soft gold; and amalgam furnished a material with which even an idiot could putty up a cavity. This condition of affairs brought into the profession many inferior men who have been a discredit to it and who have degraded instead of advancing it. This is, in my opinion, the reason why we have so many quacks in our ranks to-day. They entered the profession during this period of depression, when dentistry, as they understood it, required no qualifications and presented no difficulties. The man with the propensities of a quack will not often enter a profession that he must master step by step. If he does, the hard labor by which he advances will make him appreciate his position so much that he will be unwilling to degrade it.

This, then was the valley of humiliation for dentistry, and it was further reduced by the teachings as to the treatment of nerves. Capping was a plausible operation. It promised much and it was advocated in high places. It was easy, it saved time, and it was sure—sure death, I mean—and the forceps and another fee ended the matter.

Then came the reaction. The faults of rubber became prominent, and it was condemned as an economical resort only, while its companion, celluloid, was almost totally abandoned as worthless. The discarded tin and soft gold of the earlier practitioners came again to the front, the plastics were improved and relegated to their proper place, which they fill admirably, and the beauty of cohesive

gold and the skill required to make perfect work with it were duly appreciated.

The ranks of the profession (in the West, at least) had filled up with inferior men. Some of them knew they were incompetent and wished to improve, while others were irretrievably worthless.

Those who felt the need of more knowledge made a demand for more colleges, and following this was a demand for legislation regulating the practice of dentistry in many of the States.

Even incompetent men without laudable ambition favored those movements for selfish purposes, as being already in practice exempted them from the law, and at the same time shut off further competition, no one being able to enter the profession except qualified men.

Worthy practitioners urged this matter until they succeeded in obtaining dental laws throughout all the Western States.

These laws were a wonderful incentive to the Dental Colleges, and the latter have increased and flourished remarkably.

The beauty and utility of cohesive gold in skillful hands became manifest and stimulated every man to do his best, until the operations performed with this material were a wonder of art and durability.

Gold was again crowned king in the laboratory, with porcelain for his bride. Gold and porcelain crowns came in and stopped the mutilating work of the forceps—and increased knowledge of therapeutics and pathology made possible operations of a magnitude undreamed of before. Bridge work, with its successes and its failures, its friends and its enemies, struggled into respectable society and became a recognized means of dental prosthesis. I consider it the climax of dental advancement and the most wonderful comfort-giving operation that can be performed. The argument over it is not yet ended. I have not time to enter into it, but will only remark in passing that its faults are faults of workmanship, and that the skillfully made piece is the triumphant vindication of its claims. In unskillful hands its reputation will suffer just as was the case with cohesive gold. Orthodontia has made almost its entire growth during the last twenty years. Now there is *no* irregularity of the teeth that defies correction. Instruments and appliances have been invented and improved until a dealer's catalogue is a very large volume. The rubber dam and the engine have almost revolutionized operative dentistry. Dental societies have

rapidly increased in numbers and in membership. Our own society is an illustration of this.

The prominent feature of all these societies—the clinic—has done more to develop practitioners and to make them strive for something better, than any other one thing. To see a difficult operation performed by an expert is not only instructive but stimulating.

Our colleges have done a beneficent work in the West; they have raised the standard of practice and educated the rank and file. They have sent into the field better educated and better trained men than ever before entered it.

We have reached the apex of the advancing wave, and now, in the ebb and flow of the tide, must we go back? I do not believe it, but there are many premonitions of danger. Look at our advertisements. Did it ever occur to you that all over the country dentists are using proprietary articles? Preparations, the composition of which is unknown to the users? And what is worse, they are being made and vended by men in the profession. Does not this indicate apathy or ignorance in the users and craft, or illiberality in the makers? Some of these nostrums are even sold on the exclusive rights plan, where one practitioner pays a premium to keep his fellow practitioners in his county, city or locality from using what he *believes* to be a valuable auxiliary to his practice. He is usually swindled, and he is rightly served; but is that a professional or liberal spirit? Even proprietary anæsthetics are on the market, and human life is endangered by ignorance. I quote from the "Dental Record":

"We are sorry to find that there is a growing tendency to make use of nostrums put on the market, about which little or nothing is known of their composition or action. In America dentists have been flooded with 'local anæsthetics,' warranted to do anything and everything under the sun. Of course the majority of all such things are mere trash, and sometimes worse, for they may contain ingredients which are positively injurious. In this country there seems to be some sort of demand for secret drugs in the treatment of aching or pulpless teeth, as if we had not already a perfect legion of remedies of which we know their specific action. The demand must exist or the supply would not be advertised. What we protest against is the employment of any drug of which we cannot



trace its action, and the encouragement of merely empirical and ignorant treatment."

The demand does exist and it is ignorance that makes it.

There is another danger that I speak of with the deepest regret, and that comes from where we would least expect it—from our colleges. One of my predecessors in this chair said in his address:

"We have too many colleges, medical and dental; there is too much rivalry among them for large classes and numerous graduates to make a high standard possible. It tickles a man's vanity to be a professor, and it gives him some prestige in business. Several colleges have been founded to supply no greater want than that. This is more noticeable in medicine than dentistry just now, but it will not be so long. What are we going to do about it? Every increase in the number of colleges above the actual demand lowers the standard of education, just as glutting the market with goods lowers the price. There should be some way to prevent State authorities from issuing charters where a school is not necessary. At present any two or three men can get a charter for a medical or dental school regardless of qualifications or the needs of the profession."

Was he not prophetic? The condition is here and must be recognized. If it increases, the colleges will become mere diploma factories. It is true they have somewhat advanced the standard and made the term of study longer, but they do not do it rapidly enough. I quote from Dr. Gilmer, transactions of the Illinois State Dental Society, 1886:

"Men of inferior abilities have been attracted to our specialty because it seemed an easy way to get a living with a small capital in cash and small stock in brains. Parents frequently apply to us seeking an occupation for sons supposed to be physically disqualified for other pursuits, and, though having failed in other lines of business, they are thought to be adapted to the light work, and easily acquired knowledge necessary for the study and practice of dentistry. On the other hand, do they ever approach us, saying: 'Our son has graduated from a good scientific college, has an excellent foundation for a professional education, will you please examine him and ascertain whether he possesses the other qualities to fit him to become a successful dentist?' Not often, I imagine.

The output of graduates from a medical or dental college should be just sufficient to supply the demand and keep the ranks reson-

ably full. Whenever they do more than that, they lower the professional standard. This output can be controlled by increasing the term of study and demanding better qualifications upon entering college. This is due the profession from the colleges because they are part of it and depend upon it.

The increase of supply beyond demand lowers the standard by increasing competition and thereby causing more frequent resort to quackery and illegitimate methods and lowering the incomes of respectable practitioners, so that qualified men have no incentive to enter the field. This condition exists to-day and is rapidly growing worse. Forewarned is forearmed; we know our danger—let us try and prevent disastrous consequences.

I thank you, gentlemen, for your attention.

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#### PAIN OBTUNDENTS AND LOCAL ANÆSTHETICS. \*

BY L. C. INGERSOLL, D. D. S., KEOKUK, IOWA.

Obtundents and Anæsthetics are medicines so nearly allied in their effects that the action of one helps to explain the action of the other.

Obtundents are used to alleviate pain already existing. We speak of pain as sharp and keen. To obtund is *to blunt, to dull*. We therefore use obtundents to dull the sharpness of existing pain.

Anæsthetics are used to weaken or destroy the susceptibility to pain. Their action is prophylactic, and designed to prevent the occurrence of pain, and the ordinary phenomenon of sensation. A medicine may be a good pain obtundent, and not a good local anæsthetic.

The words *local anæsthetic* as ordinarily used convey a very indefinite meaning. *Anæsthesia* means freedom from the sensation of pain or touch. In this sense local anæsthesia is seldom known. Some however experience so satisfactory a relief from the use of the agent that they are willing to testify that an operation, ordinarily painful, was rendered painless. In most cases the anæsthesia is but partial, and the so-called anæsthetic used proves to be but a favorable lessening of the pain of a severe operation.

Let us now turn our attention to a consideration of the chemical and physiological action of these two classes of drugs.

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\* Read before the Iowa State Dental Society.

Pain obtundents act in different ways to relieve pain, depending upon the nature of the drug, and upon the pathological condition of the organ or tissue involved. A large number of drugs relieve pain by stimulation. Take a case of congestion, when the pain is severe and throbbing. The cause of the pain is the partial stasis of the blood in the part. The over-full blood vessels press upon the filaments of nerve and cause pain. In some of the capillaries there is complete blood stasis. So long as there is this tendency to a statical condition of the blood, the pain will continue. The pain is relieved whenever the blood is again put in free circulation. In this case a vascular stimulant will speedily relieve the pain. This is the philosophy of relieving a swollen and painful part by rubbing—the blood which is tending to stagnation is set into circulation, and the pressure and consequent pain, which an accumulation of blood would cause, is prevented. Capsicum, creosote, oil of cloves, oil of eucalyptus, or any of the essential oils are indicated in a case of this kind.

Should pain be caused by chemical decomposition and the formation of a septic poison, some medicine is indicated which will act as a disinfectant and destroy the products of decomposition, which are acting as vital irritants. Should pain be excited in the nerve of a tooth by simple exposure without inflammatory conditions attending it, mere protection against foreign substances will serve to obtund the pain; simply cotton saturated with wax will exclude the atmosphere, food and all other foreign substances, and relieve the pain. But as a precautionary measure to prevent the formation of septic irritants, it is better to introduce first a mild antiseptic.

If acute inflammation has already been excited, but of brief continuance, it is best to introduce a pain obtundent, which acts by cauterization, such as carbolic acid.

If pain is caused by the influence of decomposing vegetable matter within the cavity of a tooth, phenol sodique (phenate of soda) would be a good remedy. In addition to the antiseptic action of the phenol, the alkaline properties of the soda neutralize the acids formed in the decomposition and prevent further irritation from this source.

Another very important and unexplained action of some pain obtundents is the influence they have directly upon the functions of the nerves supplying the diseased part; to this class belong laudanum, wine of opium, aconite, lupulene, creosote, oil of cloves,



camphor and campho-phenique, and a number of others. This is an action which we represent as soothing and quieting. Whether there be any chemical action involved or not, I am unable to say. They seem by some unexplained process to effect a change in the nervous function—to prevent the transfer of the impression by the nerve conduction to the brain. We know very little of the action of nervines.

Most narcotics are dual in their action—primarily stimulating and secondarily sedative. This is true also in some medicines not recognized as narcotics.

Some medicines are pain obtundents, mechanically. Carbolic acid applied to any of the soft tissues suffering pain by reason of being deprived of their normal covering, devitalizes and coagulates a superficial layer of the tissue. This devitalized covering protects the more vital tissue underneath from the irritating effects of the atmosphere and saliva.

The cuticle of the skin is but a protective tissue. When by abrasion it has been removed, a smarting pain is felt. By coagulating the serum with carbolic acid, tannin or creosote as it exudes, a mechanical covering is formed which relieves the pain. Any soft cerate, a court-plaster, or any heavy neutral oil will serve the same purpose.

In passing now to the consideration of local anæsthetics, we observe in the action of the drugs employed, a striking similarity to that of pain obtundents.

Local anæsthetics for the most part, act directly upon the nerves entering the tissue. On the other hand, general anæsthetics act through the intervention of the blood and an impression produced upon the nerve centers and the brain. Local anæsthetics act upon the peripheral extremities of the nerves without the intervention of the circulation.

The most popular of drugs and methods at the present time are cocaine combined with various other medicaments of a pain obtunding or anæsthetic effect, for the soft tissues; and desiccation for the complex tissue of the teeth.

The very large number of local anæsthetics offered to and urged upon the profession from month to month and year to year is sufficient evidence of a large and persistent demand. The fact that it is thought necessary by manufacturers and venders to claim for nearly every drug that is put upon the market that it has anæs-

thetic properties, is further evidence of the widespread demand. Let us analyze this demand: it comes both from the dental profession and from their patrons. On the part of the patron, it springs from a natural shrinking from pain and a desire to avoid suffering. In a barbaric state it is common to cultivate a stolid indifference to pain and suffering as a condition most worthy of praise; and among religionists of the baser sort, self torture is considered one of the highest of virtues. They court torture and suffering as affording an opportunity to illustrate their courage and declare their religious zeal.

In civilization, where higher ends are sought than the development of mere physical courage and animal prowess, there is a desire to avoid all unnecessary pain, and a demand that all pain arising from accidents or from surgical or dental operations, shall be at least alleviated when it cannot be wholly prevented.

It cannot be expected that when experiencing severe pain and suffering, or having it in immediate prospect, the patient will devote much time to thought and reasoning concerning the various modes of anæsthesia. This important mental exercise he relegates to his chosen operator. Patients, without thought in many cases, place themselves in the hands of the operator, begging that he will be as easy as possible, and apply something to prevent the pain. Some patients have such a dread of pain as to be willing to take all risk even with an inexperienced operator handling a drug that he knows little or nothing about—are willing to face death in the operation if the operator will but have the fool-hardiness to say, in his ignorance "it is perfectly safe and harmless." An Irish woman who sat in my operating chair for the purpose of having a tooth removed, thrust her head with a sudden jerk back into the head rest, and with eyes closed, exclaimed: "Oh Lord, I wish I was dead!" These facts show the great inducements dentists have for the use of anæsthetics—local or general.

There are strong inducements also from the standpoint of the dentist. In some cases there is a feeling of human sympathy which inclines him to do all he conscientiously can to relieve and prevent the suffering of his patient. In most cases, however, it can safely be assumed that the sordid side of his nature is in the ascendancy. With such, money is the chief thing. All else is held in abeyance. It must be confessed that there are a large number in the dental profession who are disposed to make everything yield to the getting

of money—who will sell out judgment and conscience for a pecuniary consideration — who are willing to risk death and the putting their patient in eternal repose if they may but get ignorant consent to demonstrate the power of their new anæsthetic to render the extraction of teeth painless!

Why all this? Because their chief business is the making of artificial teeth, and that business prospers in proportion to the number of natural teeth they extract.

The flattering inducement of a painless operation is the winning card in dental tragedy.

What is the ethical state of the dentist who is willing to take all risks in the use of an agent he knows nothing about, if by it he can increase his patronage and make plethoric his purse. If he has any pride of professional character he will think of the harm he *may* do to his patient by his *ignorance*.

Is there no harm in local anæsthetics? Every manufacturer of these nostrums declares *his* manufacture to be perfectly harmless—that it can do no injury to any of the tissues, and supports his declaration by the willing testimony of a number of members of the profession who for a fee paid to them in money, medicine or flattery, have consented to give their aid to help the manufacturer to sell his compound. The most salable anæsthetics as those designed to prevent the pain of tooth extraction—and warranted to increase largely the business of the operator.

With the use of these drugs, and a little bull dog courage, hundreds and thousands of teeth are extracted every year that never ought to have been extracted, and would not have been extracted except for the faith the patient had in a local anæsthetic. Here is the chief harmfulness of local anæsthetics. If all were conscientious and competent operators the use of local anæsthetics would not be so destructive. But as it is thousands of teeth are sacrificed annually, that dentistry properly practiced, might save for many years as valuable members of the organism.

These drugs are applied in two ways. Externally upon the skin or surface of the gum, and by injection into the blood-vessels.

I am not prepared to say that surface applications are usually dangerous; but when injected into the blood-vessels, I believe them to be always attended with danger. Many of these drugs are poisons of a very active kind. Cocaine, aconite, opium, cannabis-indica and carbolic acid entering so largely into these preparations, we



know are poisons. Their efficacy depends upon the power of the lymphatics to absorb—which further depends upon the texture of the overlying integument. Surface anæsthesia must therefore always be very uncertain, and no dentist has a right to make any definite promise concerning the effect of the agent applied. Some persons are peculiarly susceptible to the effects of particular drugs, especially of the class named, and paralysis, tetanus and death have followed the external application upon the gum. No one not present knows, but blundering and carelessness were the direct causes of the disastrous consequences. But, in either case, the fact of danger in handling poisons, remains the same.

In the case of injections into the blood, no one can be certain that he can avoid danger—especially in the use of cocaine. Numerous cases of serious harm and death have occurred by its use hypodermically. It is subtle in its action and no one can know where its damaging influence will first be felt—It may be in a part most remote from the place where it is applied.

One says, that in inserting the needle he is careful to avoid all large vessels. With all his carefulness he cannot with certainty do it. Every one's anatomy is not the same. The blood-vessels in two different individuals do not follow the same relative course. They vary very much.

How is the case regarding local anæsthetics used to relieve the pain of a dental operation upon so-called sensitive dentine?

There is so much uncertainty as to the thickness of the dentine covering the internal dental nerve—so much uncertainty as to the form of the internal cavity, that the presence of the nerve fibrils with conductive sensibility is necessary as a guide to the operator in avoiding exposure of the nerve. If these fibers are anæsthetized he has no guide aside from a vague idea of the general size and form of such canals. With an anæsthetic agent the operator may make a painless operation in excavating and filling, and in a few days after, inflammatory action may ensue and all his previous work be lost and possibly the tooth. It can plainly be seen, therefore, that local anæsthesia under the most favorable conditions is fraught with some danger.

Suppose the agent used be oxychloride of zinc—probably one of the most certain local anæsthetics which our materia medica offers.

This drug acts by devitalization. When there is death there is complete anæsthesia, of course. The operator thinks that he will use the drug very sparingly to avoid its penetrating too deeply into the dentine. But the drug is not self-limiting. It is beyond the operator's control. Its first effect is that of a powerful irritant—causes pain and inflammation. Only its secondary effect is anæsthetic, which is the death-stage of inflammation in the superficial tissue acted upon. When this dead tissue is excavated away, more of the zinc chloride must be applied. After the operation is completed and presumed to be successful, who can tell but the inflammatory action excited will continue and the death of the nerve be the final result. This has been proved to have resulted in thousands of cases where oxychloride of zinc has been used as a filling. Look too at the unfavorable conditions attending the operation. If the devitalized ends of the fibrils are not removed in the work of excavation they remain there in contact with the living fiber to be disposed of by feeble workers—or so far as we know, to be disposed of by decomposition without the aid of living workers.

In the use of nervines and narcotic poisons for local anæsthesia there is no destruction of tissue. But in how much better condition are the tissues left? The terminal nerve fibers are paralyzed. Is paralysis a favorable condition? It is assumed that the fibers will recover their functions after the anæsthetic has expended itself. How many times and to what extent can one suffer paralysis of an organ, and experience the return of the organ to its normal condition? Who can give an intelligent and knowing answer to these questions? If none of us can, we are working in the dark when we use local anæsthetics. It should always be remembered that there is no organ of the body that has such a feeble hold on life as the vital organ of a tooth—the slightest change in its environments are causes sufficient to produce death.

Let us now turn to the popular desiccating process. There is testimony enough to show that in many cases a very satisfactory condition of anæsthesia is produced by this method.

It is practiced upon the assumption that the devitalized and decaying dentine within the cavity of a tooth has its tubules filled with a fluid or a semi-fluid substance which is agitated by the force of the excavator and is made to impinge upon the terminal ends of the sensitive nerve fibrils, thus causing pain. But the operation of anæsthesia is not complete by drying out these empty tubules. If it were so

the work of desiccation could not be harmful. But the process is often carried to the extent of desiccating the sensitive living dentine. Who shall say there can be no harm in this?

We know that nature has made ample provision for preservation of the germ life of various kinds of seeds by desiccation. But the seed is not in the same condition as a tooth. The seed life is dormant. As soon as the seed germ takes on the active functions of life desiccation will kill it. Who knows to what extent desiccation and dehydration of a tooth can be carried, and its vital functions be not damaged?

In the process of desiccation by hot air or a heated wire it is not alone the moisture derived from the saliva that is dried out. Tooth ivory itself, however hard, is not an anhydrous substance. Water enters as a compound element into its substance. When you dehydrate it you take from it one of its component elements. How soon the normal moisture will return, no one knows—nor that the absence of that moisture for a limited time even has done no harm to the vitality of the tooth. In the midst of this general ignorance of results, it is very evident that the profession are working in the dark regarding the use of local anæsthetics.

It is in the experience of every dentist of a few years practice, that he finds many cases of dead pulp for which no sufficient cause can be discovered. It seems plausible, therefore, in every such case to ascribe it to thermal changes, although the filling in the tooth be of the smallest size. The small cavities are very commonly the most sensitive. The tooth may have been anæsthetized, pain-obtunded, disinfected and medicated almost to death, for a period of half an hour by such powerful drugs as I have named in this paper. Would it be any wonder if the tooth should never after fully recover its normality?

Frequent observations of a pathological condition from unknown causes should lead the profession to use more caution in the handling of drugs they know so little about as is known concerning the after effects of local anæsthetics.

The general use of local anæsthetics should be discouraged. They should only be used in rare cases—cases in which an operation is likely to prove a failure without them, and the result be more disastrous than could have happened by the use of a local anæsthetic. The inventors and venders of these nostrums should in general be given a cold shoulder by intelligent members of the profession.



## AN IMPROVED METHOD OF MAKING FULL LOWER DENTURES UPON CAST-METAL WITH RUBBER ATTACHMENT.

BY CALVIN S. CASE, D. D. S., M. D., Jackson, Mich.

Cast-metal plates, in combination with rubber, for full lower dentures, have neither received the indorsement nor been used by the dental profession nearly as much as they deserve.

It may not be generally known or fully appreciated that an inexpensive alloy, largely composed of tin, can be easily and accurately cast upon a model of the mouth and can be worn with little oxidation upon its surface with all the beneficial influences to the mucous membrane and contiguous tissues possessed by the royal metals. Such plates for full lower dentures, when properly cast—light or heavy as may seem desirable—with plain teeth properly selected and artistically arranged and attached with pink or granulated rubber, are second only to continuous gum in durability, artistic effect and healthful influences.

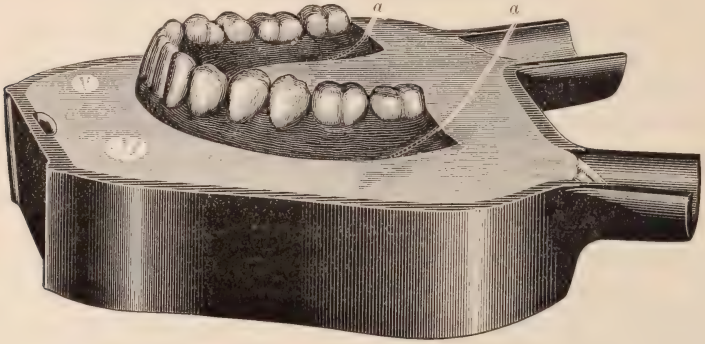
A more general adoption of these plates may have been retarded by the difficulties which beginners experience in their attempts to follow the present inexact method described in text-books for their construction. This consists in *first* casting the base-plate from a model in wax having a doubled edge or rim, and afterward placing and attaching the teeth with rubber, the same as you would were it a swedged and rimmed gold plate.



*Fig. 1* shows case ready to be invested in flask. "a. a." indicates the future line of demarcation between metal and rubber.

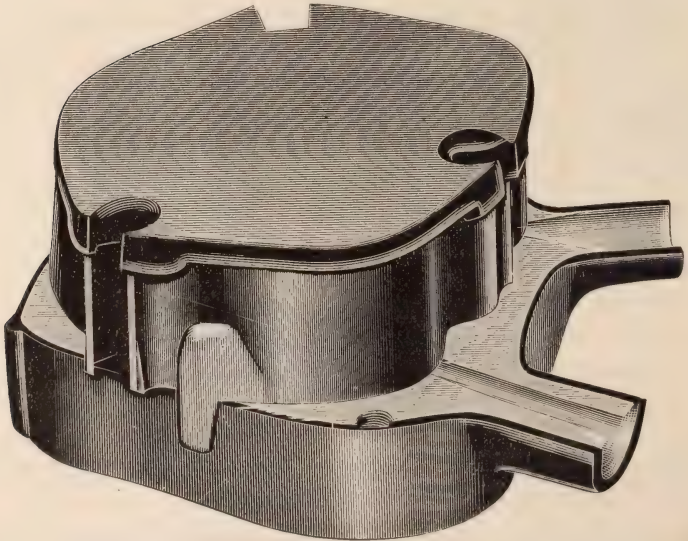
Among other difficulties with this method it is not always possible to define the width which may be desirable to give to the rim, or the plane of its outer surface, until the teeth are placed, and the wax gums properly contoured:—a matter of considerable importance, especially with the lingual contour, where it is often desirable to obtain the broadest possible metallic surface with its concomitant advantages.

By the following method the work can be accomplished with mechanical precision, and with little more labor and skill than is required to construct an ordinary rubber denture :



*Fig. 2.*

Shows case partially invested in a Watt flask.



*Fig. 3.*

Take two impressions. Fill the better one with plaster and pumice or marble dust, equal parts; the other with plaster alone. Upon the latter set up the teeth and contour the wax model of the gums the same as you would if about to construct a denture upon rubber alone.

Now transfer the case to the other model, which being composed of plaster and pumice may have been broken or injured if subjected to the movements necessary to bring the case to its present stage of development. (See Fig. 1). Partially invest in the lower half of a Watt or Weston flask with pumice and plaster; allowing the investment to rise on the sides, to a line which you will have marked on the wax (*a a*, Fig. 1), where you wish the metal to extend; except at the heels of the plate (*a a*, Fig. 2), where the wax should be left entirely exposed, to be covered by the upper investment,—for reasons which will appear. I usually make the rim on the outside or labio-buccal surface quite narrow in order to avoid



Fig. 4.

exposure of metal, and very wide on the lingual surface, allowing the plaster to rise on the inside nearly to the pins.

Make countersunk places in investment for guides,—lubricate surface,—place over the case the upper half of a *rubber flask* and fill with plaster. See Fig. 3. (This illustration is wrong where it represents the plaster cut for pour-hole and vent—an act later in the operation.) Warm and open so that only the teeth come away with the upper. See Fig. 4. If the wax should be lifted from its position in the lower half of flask it should be pressed back into place, to be subsequently cut and shaped to form a model for the cast-plate. See Fig. 5. This will vary in thickness in proportion as you wish the plate, light or heavy.



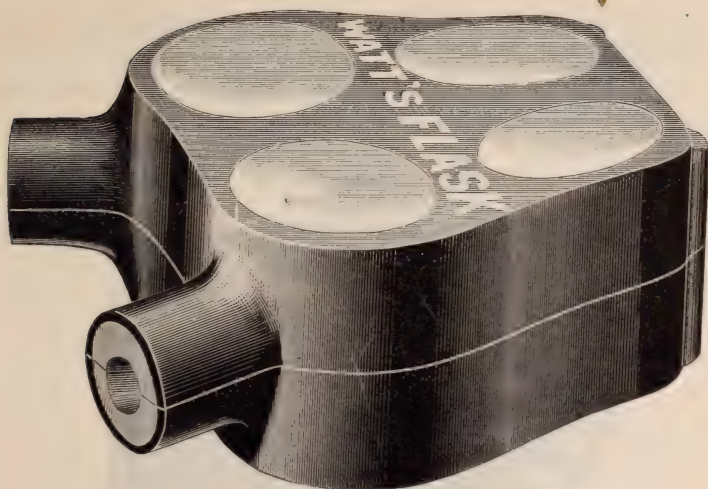
The upper surface or plane of the investment—it will be remembered—represents the height, or width of the rim, (except at the heels) therefore the wax should be cut down even with this surface;—except at the heels, when you will be guided by the line which has been previously marked on the wax. (*a*, Fig. 2.) That portion of the wax which represents the outer or exposed surface of the metal at the heels may be reproduced at any time by pressing the upper and lower investments together.



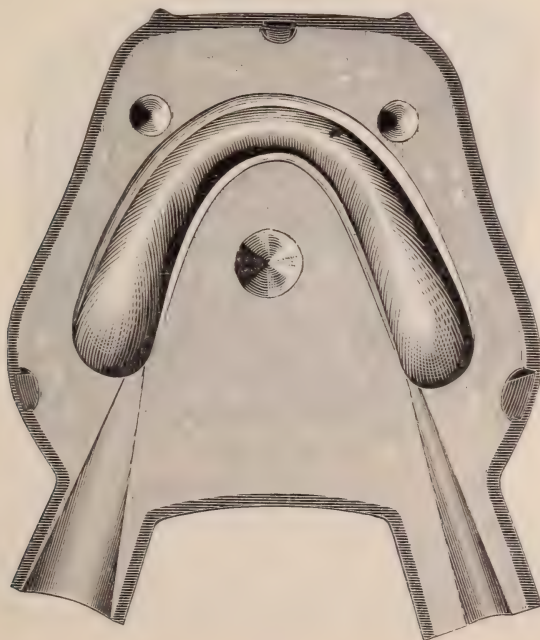
*Fig. 5.*

The wax may be carved out until that covering the ridge and forming the rim is from 1-16 to 1-12 of an inch in thickness. When duplicated in metal the intervening space between the outer and inner converging rims will be found amply sufficient to firmly dovetail the rubber and metal together.

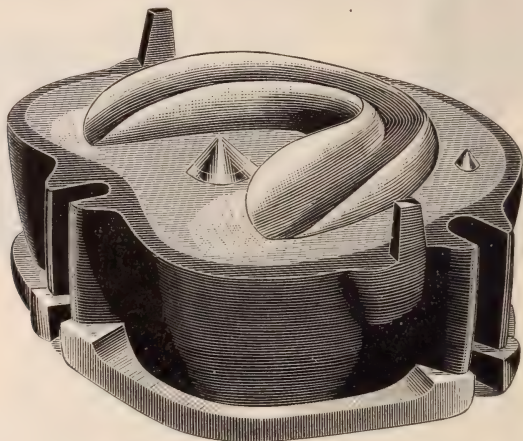
At this juncture of the operation the investments in the two halves of the flasks should be pressed firmly together in their former positions in order to perfectly reproduce the wax heels of the plate. Before this latter movement it may be well to scoop

*Fig. 6.*

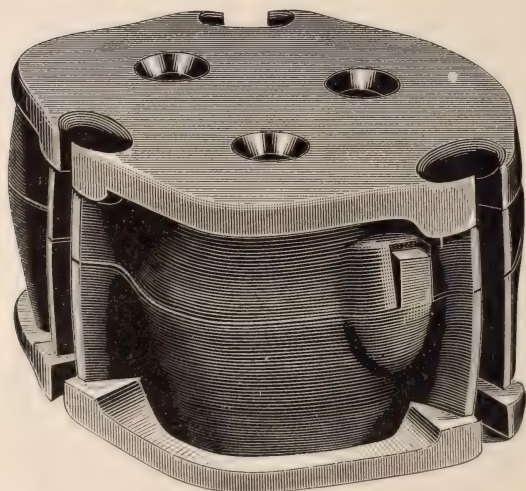
out a slight depression on the investment just in front of the teeth, as shown at *a*, Fig. 4, which, if moistened and filled evenly with wax, will leave a nipple-like extension to the wax model in the metal flask as shown at *a*, Fig. 5.

*Fig. 7.*

Now the other half of the metal flask should be placed in position and filled with pumice and plaster (see Fig. 6). Warm and thoroughly remove wax. Cut pour-hole and vent (see Fig. 7). Place the two parts together, on end, and dry till no steam will



*Fig. 8.*



*Fig. 9.*

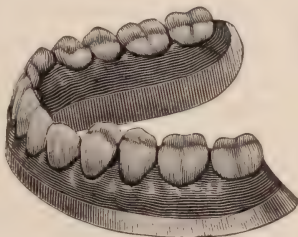
moisten a mirror when placed over the pour-hole. If the flask has become hissing hot, allow it to partially cool before pouring. The metal should be always melted in a clean spoon or one kept for this purpose, and poured at a slight degree above the fusing point.



The alloys usually used for this purpose are proprietary compounds, and sold in the market as Watt's or Weston's metal, at about one-half the cost of silver.

After removing the excess from the cast thus obtained, it will be found to perfectly fit above the investment of the teeth, as shown in Fig. 8—the heels and nipple resting in the counter depressions which formed the wax model.

Now place the other half of the rubber flask in position and fill with plaster (see Fig. 9).



*Fig. 10.*

When this has been packed and vulcanized it can be as easily finished as an all-rubber denture with a perfect line of demarkation between rubber and metal, and no excess of material (see Fig. 10).

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## PROCEEDINGS OF SOCIETIES.

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### AMERICAN MEDICAL ASSOCIATION.

#### SECTION OF ORAL AND DENTAL SURGERY.

At the meeting held in Nashville, Tenn., May 20th to May 23d, there were in attendance, Drs. Jacob L. Williams, Chairman. Boston, Mass., Eugene S. Talbot, Secretary, Chicago, Ill., J. Taft, Cincinnati, Ohio., L. E. Custer, Dayton, Ohio, Jones, Florence, Ala., Helden, Florence, Ala., Vaun, Trussville, Ala., Cook, Chattanooga, Tenn., Claywell, Lebanon, Tenn., Beach, Clarksville, Tenn., W. H. Morgan, Crawford, Stubblefield, Freeman, McFenan, Noel, Lees, Morrison, Stephens and H. W. Morgan, Nashville, G. Frank Lydston and L. D. McIntosh, of Chicago, and Henry O. Marcy, Boston. The discussion of the President's address with a paper by Dr. Henry O. Marcy, on "Cure of Cleft Palate by double flap operation," consumed the afternoon session of the first day. At the

second session, Dr. L. D. McIntosh, of Chicago, read a paper on "The value of illustrations in the lecture room," supplemented by an exhibition of his lamp, which, by a concentration of light, magnified and projected upon a screen, opaque objects as well as by microscopical specimens. Dr. G. Frank Lydston read a paper on the "Relation of Tropho-Neurosis to diseases of the mouth and jaw," with special reference to Syphilitic Necrosis. This paper was ably discussed. Dr. W. H. Hamilton, of Ohio, read a report of five cases of "Sarcoma of the Maxillaries," in which he had operated for their removal. He also exhibited photos taken before and after the operation, as well as the tumors removed.

Dr. Eugene S. Talbot, of Chicago, was elected Chairman of the Section for the ensuing year, and Dr. Henry W. Morgan, Secretary. Washington was selected as the next place of meeting.

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#### ILLINOIS STATE DENTAL SOCIETY.

The twenty-sixth annual meeting of the Illinois State Dental Society was held at the State House in Springfield, May 13th to 16th. The most important business of the meeting was the change of the constitution and by-laws, by which almost the entire business of the society is delegated to a council of nine members, of whom three are to be elected annually. By this change the members of the society will be enabled to devote nearly all of their valuable time to the consideration of papers, clinics and matters of professional interest which are instructive, beneficial and calculated to broaden rather than narrow the professional spirit of members. The appointment of committees, the consideration of petty motions of a parliamentary character, and the numberless annoying occurrences incidental to "miscellaneous business," can be performed by a few members better than by the entire society.

The final disposition of this question on the first day enabled the society to use the remaining three days to better advantage. It is to be regretted that there were so many papers read that no time remained to discuss them. The four days' meeting provides for ten sessions. Of these, two are taken up by the president's address and the reports of two standing committees (dental science and inventions), two are devoted to clinics, and one (Friday afternoon) is generally dispensed with; and as at this meeting one session was set aside for an illustrated lecture, there remained only

four sessions during the entire meeting for the reading and discussion of seven papers and the report of the supervisor of clinics, making virtually eight papers to be read and discussed at four sessions, or two at each session. It is possible that when the work of the society under the new régime is well under way, as it will be next year, the president's address, the reports of the committees on dental science and literature and art and inventions, the supervisor of clinics' report and five papers might receive just consideration. It is well enough to make arrangements for more papers than it is intended to read, but perhaps a better way would be to arrange for substitutes than to prepare a long programme, and if forsooth all are present have the last papers read in a hasty manner and summarily disposed without discussion.

Papers were read by the president, by T. L. Gilmer, W. B. Ames, S. F. Duncan, J. J. R. Patrick, G. W. Entsminger, E. H. Allen, G. W. Dennis, and a lecture was delivered by W. X. Suduth. The clinics were interesting, and many new points, methods, etc., were shown.

Taking it all in all, the meeting was better than we have had for several years past. The attendance was good, in the neighborhood of eighty dentists being in attendance. It would be a wise plan on the part of the council hereafter to recommend Springfield for the place of meeting in "off" years—that is when the legislature is not in session. While the Senate chamber is acoustically considered not the most perfect place we can find, it is better than many of the halls in which the society meets. The hotel is good, the people are hospitable, the Chief Executive and his charming wife received the society and entertained its members, while the dentists of Springfield treated them to a carriage ride. The capitol in addition to these pleasant features contains points of interest, offering opportunities to visit the tomb of the martyred president; his old home, now owned by the State; the scared battle-flags of the veterans, the arsenal, etc. Springfield is certainly central, and is favored by dentists throughout the State.

The next meeting will be held in Bloomington. The officers elected are as follows: President, T. W. Brophy; vice-president, E. K. Blair; secretary, Garrett Newkirk; treasurer, W. A. Stevens, and librarian, F. H. McIntosh.



# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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## A RAPID METHOD OF REGULATING TEETH.

At the late meeting of the Illinois State Dental Society, Dr. J. B. Morrison, of Indianapolis, described a new surgical operation for bringing forward or backward incisors, cuspids and bicuspid teeth. We requested a short description of this operation, which will be found below:

*To the Editor of the Dental Review:*

DEAR DOCTOR.—As you requested a “short letter,” giving the points of the immediate method of correcting “irregularities of the teeth,” I take the first opportunity to comply, at the same time thanking you for the compliment.

### PROPOSITION.

A tooth or teeth can be changed from one part of the mouth to another with as much ease to patient and operator, and with as much promise of a rapid appropriation of and union with its surroundings, as a plant is taken from one part of a flower-bed to another.

The only point necessary to fully understand this method is to ask the question: What stands in the way to prevent us from moving a tooth which is out of position, to the position it should occupy? The answer is easy: That portion of bone, etc., between the two positions. Then why not remove this obstruction—bone, gum and all—from in front of the tooth, move the tooth with its surrounding socket and gum margin, to the position desired, and put the part removed from in front of the tooth in the place from which the tooth was moved. Then all nature has to do is to unite

the clean-cut surfaces of bone, periosteum and gum. It is not always necessary to use the section removed, as a thin plate of bone can be made to follow the tooth, or there may be too much room and the arch must be contracted by taking out a section.

In cases where the apex is the pivot upon which the tooth is inclined or rotated the pulp will not be disturbed, but where the tooth with its socket must be taken up and placed in another part of the arch the nerve supply is broken, and unless it is placed in contact with other nerve supply, the pulp must be removed in the usual way, either before it is re-set in its new position, or after the union of bone and gum has taken place. As there is little or no laceration of tissue, this union will take place almost immediately. A simple band to the tooth or teeth on either side, kept in position for a few days, is usually all that is necessary to insure its retention in proper position till a natural and perfect union takes place.

The same method can be applied to several teeth which are to be moved separately or altogether. If they all have to move together in the same direction, they may be cut loose in one section without cutting between the teeth.

According to the old methods pressure is applied to the tooth toward the desired position until this section of bone is absorbed by inflammation and the tooth must be secured in its proper place till a corresponding section is re-formed along the path through which the tooth has been moved.

The *Immediate* method does all this *at once*, by cutting out this section of bone with its overlying gum, and also cutting down through the gum outside of the gingival margin and through the bone outside of the socket of the tooth and far enough toward the apex that the tooth with its investing socket and gum margin can be easily pressed through the path already prepared for it, and the piece of bone with its overlying gum, which was taken from in front placed behind the tooth.

This method is presented with the hope that it may become to others what it seems to be to the undersigned—an easy, painless, immediate method of correcting irregularities of the teeth.

An anæsthetic should always be given with properly-constructed instruments, as there is no laceration of tissue and nothing to be thrown off or absorbed by inflammation, the operation and subsequent restoration to health is in most cases far less difficult than an

ordinary case of extraction, which tears the tooth from the socket and leaves almost the worst possible condition for speedy return to the healthy condition.

Very respectfully,

J. B. MORRISON, Indianapolis, Ind.

Dr. Morrison uses an instrument made from a Gillot pen. The edge is sharpened (not the pen end) and a clean cut is made down through the gum and alveolar socket. This is then removed aseptically, and the tooth forced into position and the incised piece of bone and adherent gum slipped into place behind or forward of the tooth operated upon.

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#### A CODE OF ETHICS FOR DENTAL COLLEGES.

Probably one of the most pronounced features distinguishing dentists who are members of dental societies from those who are not, has been brought about by the requirements of societies in the matter of ethics. One of the first conditions governing the applicant to any society is that he shall subscribe to a certain code of ethics, and the moment he has done that—if done in good faith—he has drawn a decided line of distinction between himself and the army of quacks and charlatans who infest the profession. It is this code of ethics always before his mind which presses upon him the necessity for strict professional conduct, and while the spirit of the code is often transgressed in individual cases, yet the influence upon the profession generally has been immeasurably beneficial.

But what shall we say of our dental colleges? Shall our societies be governed by high ethical standards, and our colleges be left to conduct themselves in a slipshod manner wholly unbecoming professional institutions? A college should be governed by a code of ethics at least as stringent as that governing the private practice of any of its faculty.

It is, in fact, more important that a college should be conducted in a strictly professional spirit, than that a society should lay down a rule of procedure for its individual members. While both the college and the society may be termed educational institutions, the former deals with individuals in the formative stage of their professional life; the latter takes them when presumably their ideas of professional dignity are already formed. The power of precept has too often been exemplified to require emphasis here, but it is not too much to say that if some of our young graduates of to-day should go far amiss in matters of ethics, they might with propriety



point to their Alma Mater as setting them the first example. If a student sees in the public prints a quack advertisement of his own college holding out inducements for patients, it will not require much of a stretch of his conscience to make him resort to the same methods.

The college has come to be an immense factor for good or evil in the profession, since nearly all of our applicants for license to-day are graduates. The college moulds the mind of the future practitioner; it gives him his first impression of professional life; it mends or mars his tendency to a perfect professional career.

We do not wish to criticise in detail all the evils existing in our colleges, but most of them are traceable to the one idea of money-getting. It is an imposition on the profession and the people to conduct an institution of this kind for the prime purpose of emolument. In any but State institutions it is of course necessary to make revenue enough to procure the best advantages in appliances and instructors, but beyond this the conduct of the college should be governed with a view to the greatest amount of good rather than the greatest amount of gold.

A code of ethics to which all the colleges belonging to the National Association of Dental Faculties should subscribe would be in line with the recent advancement made by that body. We are not presumptuous enough to submit a code for their consideration, believing the matter to be in better hands if left to the Association itself, but we earnestly recommend that at the coming meeting in August, a committee be appointed to draft a code to be submitted to the main body. Then let them discuss it fully with the true interests of the profession in their minds, and when they arrive at a code which in their wisdom seems the most suitable let them adopt it unanimously.

If this be done, and the code afterwards be adhered to, we shall have less complaint from the profession, and the stigma "colleges for revenue only" will no longer hit the mark so closely as it does to-day.

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#### ACTIVITY IN DENTAL CIRCLES IN CHICAGO.

The month of June witnesses a wave impulse of activity throughout the various dental societies in Chicago, which will tend toward increased mental and social improvements. Under the auspices of the Chicago Dental Club, Dr. W. X. Sudduth delivered

a course of ten lectures, illustrated by the stereopticon, upon the subject of "Pathological and Physiological Cell Development and Micro-Organisms." A large and interested audience was in attendance throughout the whole series, invitations having been sent to a majority of the dentists in the city, and the presence of a number of ladies was noticed. These lectures outlined and discussed the accepted theories of cell development and the germ theory in the most recent phases or discoveries.

Dr. G. V. Black of Jacksonville read a paper on "The Intproximate Spaces" before a large assembly of members and guests of the Odontographic Society.

The Odontological Society and its invited guests listened to an interesting paper by Dr. E. D. Swain and a discussion on new combinations of filling materials for restoring and preventing the ravages of caries.

The Chicago Dental Society has received upward of twenty applications for membership during the months of May and June, and the programme of essays for the ensuing year warrant an increased interest on the part of its members.

This state of affairs evidences progress that cannot fail to win the approbation of the profession, and prophecies the success of the Second International Dental Congress, to be held in Chicago in 1893.

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DR. HOMER JUDD.

The dental profession of Illinois and of the whole country will learn of the death of Dr. Judd with unfeigned regret. The sad event occurred May 20th, after a prolonged illness. Dr. Judd was a conspicuous figure at the annual meetings of the American Dental Association for many years, and when he finally retired from practice it was felt that one of the foremost men in the profession had gone from scenes of active life. He was one of the acknowledged authorities in pathology and a most effective speaker. His studies in pure science and the languages gave him great advantage in debating, and few had the temerity to attack, once he had spoken on any scientific subject. He was honored as presiding officer successively of the various local societies in Missouri, and nearly a quarter of a century ago was president of the American Dental Association. It was our privilege to be associated with him on the Illinois State Board of Dental Examiners, where he was ever ready to lend coun-

sel, which, from his ripe experience, he was so well calculated to give in a manner that endeared him to all who came for advice.

One by one the best and the greatest are gathered to their final resting place, and we mourn to-day the teacher, the journalist, successful practitioner and ripe scholar, whose inspiring presence will be remembered with tenderest feelings of personal bereavement.

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#### AN IMPORTANT CHANGE.

We are in receipt of the following news item: "Dr. W. X. Sudduth of Philadelphia has been appointed secretary of the Dental Department of the University of Minnesota. He will fill the chair of pathology and oral surgery and be practically the dean of the school." This is a deserved compliment to Dr. Sudduth, who has done so much valuable work in oral pathology and histology, mostly in the east but latterly at the University of Iowa. We do not know whether this change will carry the *International Dental Journal* to Minneapolis or not, but it is an advantage to the university to secure the time and labor of an enthusiastic investigator, and we offer our congratulations to the school and to Dr. Sudduth. Dr. W. P. Dickinson of Dubuque, Iowa, has concluded to locate in Minneapolis, so Iowa loses two of her foremost men and Minnesota gains them.

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#### A NEW DENTAL JOURNAL.

*The Dental Mirror* will appear in June or July with Dr. R. Ottolengui as conductor. Our readers have had the benefit of his contributions for some time, and we can assure them that if they send a dollar and get the new journal for a year they will not regret it.

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#### FOREIGN CORRESPONDENCE.

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##### REPAIRING BROKEN BRIDGE WORK.

*To the Editor of the Dental Review:*

DEAR SIR.—I very frequently see, not only in the DENTAL REVIEW, but in other journals, remarks upon the difficulties attending the replacement of a tooth when broken from a piece of bridge work.



Now this operation need not be the terror to my dental brethren that it at present seems to be. I will give you my method of contending with cases of this description :

First supposing that the backing and flushing is of a substantial nature, cut off any projecting pins that may be remaining, then with a suitable corundum point in the dental engine, grind off remainder of pins and sufficient of the backing to remove any convexity of surface that might remain at that point; this is to allow the new tooth to fit close to the backing, and to remove any strain, as it is always the greatest just there.

Select a suitable tooth, which must be one of Ash & Sons' (as American teeth do not possess the requisite length of pins, besides possessing the disadvantage in this case of having said pins alloyed with iridium, which would render them much too stiff to work well, which is not the case with Ash & Sons' productions). The next step is to find where the pins are to penetrate the backing, drill the holes with a spear-pointed drill lubricated with glycerine or vaseline. This will simplify this otherwise tedious process. After the tooth has been let down nicely with a fine fissure bur lubricated as before described, cut two grooves laterally, just beyond the pin-holes, on the palatal side of the backing, extending beyond the pin-holes vertically, and then with the right angle carrying an inverted cone bur of a suitable size, remove sufficient of the backing between the lateral grooves to form as it were a small dove-tailed box. Replace the tooth, then with a suitable instrument (I use a pair of curved excising forceps) bend the pins together, the ends passing each other, drawing them firmly against the bottom of the recess, pack with soft, quick-setting amalgam, and polish when set. In some cases a small amount of oxyphosphate between the tooth and backing will be found an advantage.

This method will be found to produce the most satisfactory results, as its practice for upward of five years has failed to develop anything to its disadvantage.

Yours truly,

W. MITCHELL.

39 Upper Brook St., W.,  
London, England.

APRIL 19, 1890.

## REVIEWS AND ABSTRACTS.

ON THE DANGERS ARISING FROM SYPHILIS IN THE PRACTICE OF  
DENTISTRY.

BY L. DUNCAN BULKLEY, A. M., M. D., Attending Physician to the New York  
Skin and Cancer Hospital.

*(Continued from page 353.)*

Leloir<sup>1</sup> mentions having seen a man with chancre of the gum, in whom the infection seemed to have taken place in consequence of cleaning and filling a cavity in a tooth with soiled instruments. Lydston<sup>2</sup> has likewise reported the case of a woman with syphilis, in whom the chancre on the gum, below the lower middle incision, appeared to be the result of cleaning and repairing of the teeth, done three weeks previously. The glands beneath the jaw began enlarging a week or more after the appearance of the sore on the gum.

Roddick,<sup>3</sup> of Montreal, has recorded a case of more than usual interest, where the primary syphilitic sore on the gum was undoubtedly the result of inoculation by means of dental forceps used in extracting a tooth. This case is worth mentioning somewhat in detail. The patient, aged about 30 years, was the wife of a physician, and the mother of healthy children. She had been in excellent health until about a year previous to her visit, when she had a tooth extracted, the operation being difficult and accompanied by considerable laceration of the gum. The wound showed no tendency to heal, but became sloughy and indurated. Within a few weeks the glands beneath the jaw were found enlarged, and shortly after an erythematous rash covered the body and extremities, followed later by a papular and squamous eruption. Sore throat and alopecia were soon added, to complete the picture of constitutional syphilis. Careful investigation failed to reveal any other source of contagion than the dental operation; the husband was entirely free from disease, and Dr. Roddick, who is an exceptionally careful man and thoroughly qualified to judge, concluded that "in all probability the instrument used by the dentist was made the vehicle of

<sup>1</sup> Leloir: *Lecons sur la Syphilis*, 1886, p. 62.

<sup>2</sup> *Journal of the Medical Association*, 1886, p. 954.

<sup>3</sup> *Montreal Medical Journal*, August, 1888, p. 93.

contagion by being brought in contact with a mucous patch in the mouth of a syphilitic person previously operated upon."

In the second division of this portion of the subject, namely, the dangers from syphilis to the *operator* in dental procedures, the number of instances on record is fewer, but they are very striking and well authenticated.

The first instance discovered was that of a dentist who reported his own case.<sup>1</sup> The inoculation took place on the middle finger of the left hand, above the nail, and was followed by constitutional syphilis. He could not trace the infection to any particular patient, but there could be no doubt that the poison came from mucous patches in some one's mouth, and lodged in one of the little cracks which are so common about the root of the nail. Bumstead,<sup>2</sup> when speaking of the digital inoculation of accoucheurs, says that he has "known dentists to suffer in the same manner." Neumann<sup>3</sup> knew of a dentist who tore his hand on a sharp tooth while operating on a syphilitic patient, which injury was followed by severe syphilis. Jonathan Hutchinson,<sup>4</sup> in his excellent little clinical work on syphilis, gives an illustration of a well-marked, circular, indurated chancre on the pulp of the finger of a dentist, which had been produced by a scratch on a patient's tooth.

Although the number of these recorded instances of syphilis communicated in dentistry which I have been enabled to find, after a very careful study of the subject during several years past, is relatively small, it is yet quite sufficient to establish the fact that such infection does occasionally take place, and to place us on our guard against such accidents in the future. Undoubtedly but few of the cases occurring have ever found their way into print, and it is possible that when special attention has been called to the subject, many more will be recognized and reported.

Having now considered the clinical basis on which rest the grounds for believing that there are dangers arising from syphilis in the practice of dentistry, we will examine the modes in which this accident can arise, and then consider the means for preventing the occurrence of this sad event. Two methods of the non-venereal transmission of syphilitic virus are recognized, namely: First,

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<sup>1</sup> Boston Medical and Surgical Journal, vol. lviii. p. 38.

<sup>2</sup> Venereal Diseases, edition of 1879, p. 432.

<sup>3</sup> Neumann: Allgemeine Wiener medizinische Zeitung, 1884, p. 61.

<sup>4</sup> Syphilis, London, 1887, Plate II., Fig. 2, p. 96.



the direct, and second, the indirect. In the first instance the poison is transferred directly from one individual to another, either in already existing wounds or in those occasioned at the time. The number of recorded cases of the communication of syphilis by kissing is now very great; hundreds can be found in literature, and I myself have seen over thirty cases of chancre of the lips. Infants at the breast of syphilitic nurses frequently acquire the disease, and breast-drawing by adults has given rise to numberless cases. In several series of instances syphilis has been both acquired and given by the application of the tongue to the eye to remove foreign particles and to heal disease; the disease has also been acquired and given in the process of wound-sucking, and other more rare modes of transmission which have been reported could be enumerated did time permit.

The particular method which is, perhaps, of most interest to us in the present connection is that of tooth-wounds. The number of cases of this class which are on record is very great; nearly all of them are from bites, usually intentional, and details of these need not be presented here. There are also a number where the infection has taken place from a blow on the mouth, the knuckles being wounded by the teeth. The first of these tooth-wound cases was observed about the beginning of the present century, by Boyer,<sup>1</sup> but not reported until 1840, by his son. Since that time a number of observers have recorded cases, some of whom have each seen several. Thus, Gamberini<sup>2</sup> saw three cases; C. Pellizzari,<sup>3</sup> three cases; Van Harlingen,<sup>4</sup> five cases; Lavergne and Perin,<sup>5</sup> five cases; Lesage,<sup>6</sup> three cases; Finger,<sup>7</sup> four cases, and Jonathan Hutchinson,<sup>8</sup> three or four cases.

In connection with this may also be mentioned the fact that surgeons have repeatedly been inoculated in wounds acquired during operations on syphilitics, as also in other wounds when examining those with the disease. When we consider the relatively

<sup>1</sup> Gazette Medical de Paris: Behren's Syphilidal, 1841, iii. p. 322.

<sup>2</sup> Gamberini: *Giov. Ital. d. Mal. Ven.*, 1878, p. 365.

<sup>3</sup> Pellizzari: *Giov. Ital. d. Mal. Ven.*, 1882.

<sup>4</sup> Van Harlingen: *Philadelphia Medical Times*, 1884-5, xv. p. 80.

<sup>5</sup> *Annales de Dermatologie et de Syphilographie*, 1884, 2d series, v. p. 332.

<sup>6</sup> *Chancre par Morsure*, These de Paris, 1885.

<sup>7</sup> *Die Ven. Krankheiten*, 1886, p. 14.

<sup>8</sup> *Syphilis*, London, 1887.

large number of physicians and surgeons who have become thus accidentally inoculated in the discharge of professional duties (and I myself have seen at least seven or eight cases), the only wonder is that the accident does not occur oftener to dentists, whose fingers are continually bathed in the buccal secretions, often from mouths with active and intensely contagious syphilitic lesions.

Syphilis is rarely communicated to the patient in dental operations by the direct or immediate method of contact, although the case of the communication of syphilis by tooth transplantation, already referred to, were probably by the direct method, the poison being undoubtedly carried directly in the transplanted tooth from a syphilitic to a healthy person.

It would also be possible for a dentist with an unrecognized chancre on the finger, in an early stage, to communicate the poison directly to a patient's mouth, as in the case of midwives, already mentioned; but no such case has been found in literature.

The second, indirect or mediate, method of contagion is that which usually takes place in cases where the disease is transmitted during the operations of dentistry, and, indeed, in a large number of the cases of syphilis innocently acquired.

Time and space would fail to tell of even a few of the methods of mediate contagion of syphilis which are scattered throughout literature, but a brief statement of some of the principal modes by which it has been observed to be conveyed innocently from one person to another, may aid us in understanding how the accident can occur in connection with dental operations.

As is well known, various household utensils, such as cups and drinking vessels, spoons, tobacco pipes, etc., have been the means of spreading the disease to hundreds of cases. The glassblower's pipe has also caused a number of small epidemics, and cases have been traced to the assayer's blowpipe, to whistles, musical instruments, toys, pencils, pins, tacks, nails, thread, paper money, coin held in the mouth, etc. Of instruments used about the mouth, laryngoscopes and tongue-depressors are peculiarly liable to transmit the disease, but the only instance found is a case reported by Jumon,<sup>1</sup> in which a paper cutter used to depress the tongue gave rise to syphilis. The cases traced to the use of the Eustachian catheter have already been mentioned.

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<sup>1</sup> These de Paris, Syph. Ignoiee, 1880.

Syphilis has also been conveyed by means of various fabrics, and a number of striking cases are on record where towels and napkins have transmitted the disease. An interesting case is given by Leloir,<sup>1</sup> where syphilis was communicated by means of a handkerchief.

Of peculiar interest are the cases, of which there are a number on record, where the venereal disease has been transmitted by means of a tooth-brush. This was first observed by Blumenbach, where a lady received a chancre of the tonsil, apparently by means of tooth powder, her syphilitic nephew dipping his brush into her box when cleaning his teeth.

It is understood, of course, in all these instances, that the various objects served as media to convey the dried syphilitic secretion which adhered to them directly to the tissues of the individual who became infected, and it is readily seen how, unless precautions are exercised, the various implements and articles used in dentistry may likewise very easily become the bearers of syphilitic virus.

It is not always possible to determine exactly upon which instrument or in what manner the poison is conveyed, but the preceding instances show that the infection did take place in some way in connection with and in consequence of dental operations. The agents which may become the conveyors of the poison are as numerous as the implements and articles which may come in contact with the mouth in dental manipulations. For convenience these may be grouped in four classes, as follows: First. Instruments proper. Second. Napkins. Third. Rubber dams, wedges, dental floss, etc. Fourth. Plaster, rubber, etc., used in the making of artificial teeth and sets.

Among instruments, the only one plainly shown to have communicated the disease is the forceps, in the case related by Dr. Roddick, in which the site of the extracted tooth, where the gum was torn by the forceps, became a syphilitic ulcer, the seat of the chancre or primary sore of syphilis. But it is readily seen that the instruments used in excavating and plugging may also become infected, while there is peculiar danger in such instruments as files, burrs and drills, where there are many places difficult of cleansing which may receive and retain the virus. Napkins and towels may

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<sup>1</sup> *Lecons sur la Syph.*, Paris, 1886.

<sup>2</sup> *Bibliothek fur Aerzter*, iii. p. 197.



convey the poison, as has been shown, while rubber dams, if used a second time, would very easily convey infection from their prolonged contact with the soft parts. The same is true of wedges, portions of one being often used for different patients, as also thread, ribbon, or dental floss passed between the teeth. The different workmen in a furrier's shop were once infected<sup>2</sup> from a thread passed between them and bitten off. My scanty knowledge of the process of taking casts and preparing and fitting artificial teeth does not permit me to speak in regard to any dangers from this, but I should judge that possibly some danger might arise, perhaps quite as unexpectedly as it has in other branches of dental practice.

We come, finally, to the most practical and important part of our subject, namely, the prophylaxis, or prevention of the occurrence of this most unfortunate accident, the transmission of syphilis in the practice of dentistry. It may be somewhat out of place in the presence of a society composed of the best elements of the dental profession in New York to urge the simple matters of precaution about to be mentioned; but, as some may not heretofore have recognized the immense importance of the matter, it is best to err on the safe side, and to present briefly and clearly the precautions which seem to be indicated from what we know of the nature and virulence of the poison of syphilis.

As before mentioned, the virus or contagious element comes in liquid form from a chancre or a moist, exuding surface, or, more rarely, with the blood itself from a fresh wound. The secretion is very sticky and adherent, and when dried on an article forms a delicate coat which can hardly be perceived. Nothing is known in regard to the viability of the virus, or the length of time during which it may retain its actively contagious character, but from many instances in the various conditions of life and in medical experience, it would seem that under proper circumstances it retained its vitality and activity for some considerable period—longer than that possessed by the somewhat similar virus of vaccine. Days, weeks, or, perhaps, months, after an instrument or article has become infected it may again give off the poison and produce inoculation. Simple washing will not destroy the poison, although it may so dilute it that it becomes innocuous.

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<sup>2</sup> Archiv. f. Derm. et Syph., viii. 660.

There are, however, several elements which are destructive to its life, and these are heat and cold, and the so-called disinfectants, antiseptics, or germicides. Cold can hardly be utilized practically, as a sufficiently low temperature for a sufficient length of time would be difficult to maintain. Heat, however, may readily be employed in a thoroughly efficient manner, and is undoubtedly the very best means for destroying contagious principles. Inasmuch as dry heat, as in a flame, would injure the temper of instruments, the desired results are best reached by means of moist heat, obtained in boiling water.

Instruments and other articles placed in a vessel and then subjected to vigorous boiling for half an hour or so may be considered absolutely free from any power of conveying contagious matter.

Various chemical substances are also capable of destroying the virus when efficiently used; prominent among these stand bichloride of mercury and carbolic acid. The mercurial salt has its disadvantages, both from its poisonous nature when in strong solution, and also from its corroding action on some metals. Carbolic acid, therefore, remains as the best of the two, and, indeed, when properly used, answers all the requirements of the case. But one must not be deceived by the odor, and be led to use a weak solution, for it is questionable how serviceable the high dilutions used in antiseptic surgery are in overcoming such a poison as syphilis. The strong acid certainly destroys it, and a safe method is to dip the instruments in a ninety-five per cent solution, wiping or scrubbing them afterward. A much weaker strength, even a ten per cent solution, would probably be effective if they were left in it a considerable time, and then thoroughly washed. I will not take the time to discuss other disinfectants, but I wish to impress the fact that, not only for ordinary cleanliness, but also and particularly to avoid the possible danger of infection, too great care can hardly be used in rendering instruments and everything pertaining to dental practice as absolutely clean as thought and labor can possibly make them.

Files and burrs are particularly liable to catch and hold the poison of syphilis in their fine serrations, and as they are also particularly liable to wound the soft parts, they may readily become means of contagion. Also, the various articles connected with polishing the teeth are dangerous if not properly cared for. I well remember more than one dentist, in times past, polishing my own

teeth with a bit of wood dipped in pulverized pumice-stone, which wood had evidently been used for former patients. Rubber dams and wedges can of course be readily disinfected in strong carbolic solutions, and napkins by boiling.

In regard to the personal prophylaxis of the dentist against acquiring syphilis in dentistry little need be said. The careful guarding of fresh wounds, and thorough cleansing of the hands, and immediate sucking of any wound made during operations, will generally suffice to prevent the untoward event. "Forewarned, forearmed," applies well in regard to all the dangers from syphilis in dentistry; if the danger is thoroughly well known and appreciated, half the battle is over.

The question here arises, how far the dentist should be able to recognize syphilis and avoid its dangers. Undoubtedly it would be most desirable that this knowledge should be obtained; but unfortunately a practical acquaintance with syphilis is somewhat difficult, except after considerable clinical experience with the disease. But it is certainly extremely desirable that the mouth lesions should be known by dentists so as to be recognized, and this would be a fitting subject for the consideration of instructors in dental colleges.

In concluding our discussion of this topic, I would add that I by no means wish to excite unnecessary alarm, but only to present facts already well known and conclusions which must be accepted by all those acquainted with the subject. With the presence of such a disease among us, which often appears even in the best class of society, it is well to recognize and understand the dangers which may arise therefrom, and to do our utmost to avert them; this I trust will be the result of the presentation of the subject which has been considered.—*Medical News*.

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LAKE CHAMPLAIN AND ITS SHORES. By W. H. H. Murray ("Adirondack Murray"). Boston: De Wolfe, Fiske & Co., 365 Washington street. Cloth bound, 8vo, 261 pp. Price \$1.00.

The reputation of this author is international, and in this new volume just from the press he again gives ample proof of his special genius in narrating the lovely scenes of nature. The magnificent sheet of water and its beautiful shores are described in an interesting and pleasant manner calculated to arouse equally the interest of him who seeks for the purposes of pleasure or repose



those places on earth where the Creator has made indelible proofs of his existence, and of the fisherman whose heart fills with ecstasy more rapidly by the sight of a long string of fish than by beholding all the gorgeousness of Nature in her loveliest garb.

But aside from its interest in this respect the volume is well worth the reading for the reason that the author desires to "call national attention, especially of scholars and students in our colleges and public schools, to the historic events which had occurred in this valley, and their intimate connection with American liberty and civilization; for it seemed that these would be intensely interested in a theme so significant, and to which their attention may never have been directly called." "As among waterfalls there is but one Niagara in the country, so among lakes there is but one Champlain."

#### BOOKS RECEIVED.

FRIESE'S DENTAL BOOK. All rights reserved. Copyright. Philadelphia: H. D. Justi's Dental Depot, 1890.

This is a dental record book containing 186 pages, having on each page nine separate cuts of the natural teeth. Spaces for date, hour of operation, name, residence, credit, debit memoranda, etc.

#### PAMPHLETS RECEIVED.

CARDAIC THERAPEUTICS. By Joseph M. Patton, M. D., Chicago, Ill.

CERTAIN FORMS OF DEVIATION OF THE NASAL SEPTUM. By Noreau R. Brown, M. D., Chicago, Ill.

A REPORT OF SEVEN CASES OF VAGINAL HYSTERECTOMY. By J. H. Etheridge, A. M., M. D., Chicago, Ill.

A RATIONAL METHOD OF OBTAINING EXTENSION OF THE SPINAL CORD AND COLUMN. By C. F. Stillman, M. D., Chicago, Ill.

MANUALE POPOLARE, per C. Conservazione del Cavo Orale, etc. Pel Prof. Guiseppe Cali de Napoli, Italy.

IRREGULARITIES OF THE TEETH. Remarks by W. C. Barrett, M. D., at the Annual Meeting of the First District Dental Society of the State of New York, for 1890. Reprinted from the *Dental Cosmos* for March, 1890.

## PRACTICAL NOTES.

## CHLORO-PERCHA AS A ROOT FILLING.

GEO. E. ZINN, D. D. S., CHICAGO, ILL.

In the face of arguments for and against different root fillings at present, it is difficult to tell which is the best material to employ.

Lead is used on account of being tolerated by living tissue, as is no other substance. In case of retention of a bullet in the body it is enclosed by nature in a protecting sheath or membrane, and its advocates claim the same process by the tissue at the apical foramen when lead is employed as a root filling.

The majority of canals to be filled are small and tortuous, and it is impossible to adapt a lead cone to the walls and properly close the foramen. Where a canal is left with an unfilled space the operation will be a failure.

Oxy-chloride of zinc is more adaptable to tortuous canals, but it is granular, is liable to enclose air bubbles, and will always disintegrate on exposure to moisture, which is unavoidable at the apical foramen. In a few years at most it will leave open a portion of the canal.

Wood points I defend when used as a core to force chloro-percha to the walls and compact it, and with these I have had success, but the chlora-percha was in reality the filling.

Chlora-percha is said to shrink and leak. Experiments have shown that if the material is of a creamy consistency, such as is usually employed in canal filling, the excess of chloroform will escape leaving the filling porous. To avoid this porosity it should be pumped in with a broach until most of the chloroform has evaporated and it becomes putty-like, adding more of the fresh until the canal is full, some operators then take oxy-phosphate of a putty consistency and pack it well down in the canal. It will compact and press to the wall the chlora-percha. Care should be taken not to force anything through the apical foramen which can be avoided by watching the patient.

This I consider the best root filling, and give below an experiment, which proves its efficacy.

Having cleaned some teeth, I embedded their roots in plaster. I let the plaster harden firmly, then filled the roots as above. I took them from the plaster and put them in water for six months.

This kept them moist, as the tooth in the jaw is constantly subjected to moisture over the whole of its surface.

I then placed them in a solution of green aniline water and shook them well every day. After three months I opened them along the canal with a sharp chisel, examined them with a sixty-diameter glass and found no coloring within the canal, showing that no moisture had entered. I also found some shrinkage, not from the wall but manifest in small isolated cells, which were dry. The canal had been perfectly filled, the shrinkage was barely visible under the glass, and there was no leakage.

The foregoing satisfied me that the objections to chloro-percha are not sustained by facts, and that it is the most practical, adaptable and indestructible root filling in use.

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## MEMORANDA.

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There is some talk of a dental college to be opened in Peoria, Ill.

Missouri State Dental Association meets at Pertle Springs, Mo., July 8th to 11th.

Washington will be the next place of meeting of the American Medical Association in 1891.

Dr. J. F. Sanborn, of Iowa, is to write a series of articles on Physiology for the *Items of Interest*.

The wedding bells are ringing! Dr. L. C. Ingersoll led Miss Minnie M. Banks to the altar on June the tenth.

May was an exceedingly dull month. There was not a single dental college incorporated in the entire State of Illinois.

Dr. E. S. Talbot was elected Chairman of the Dental Section of the American Medical Association, at the meeting in Nashville.

Dr. W. B. Ames has suggested the incorporation of precipitated copper with gutta-percha, as a temporary filling in children's teeth.

The annual meeting of the Colorado State Dental Association has been postponed from June 3d to June 24th. The meeting will be held in Denver.

The annual meeting of the Arkansas State Dental Association, which was to be held in Little Rock, Ark., has been postponed until next fall. Due notice of the date will be given.

Soften base-plate gutta-percha and work ordinary alloy filings into it until it takes up about 30 per cent, then use it as ordinary gutta-percha for temporary fillings. You will like this combination.

A judge in Wisconsin has decided that a dentist has no legal right to pull a tooth on Sunday. A man who would crawl out of paying a dental bill on a quibble of this kind, must be an ineffably mean creature.



We regret to report the news that Dr. W. H. Morgan, of Nashville, Tenn. is seriously ill, suffering from ileo-colitis. Dr. Morgan is 72 years of age and considerable apprehension is felt by his family and friends.

A new disinfectant has made its appearance under the name of theocamph. It is composed of camphor with sulphurous acid, containing over sixty times its volume of sulphuric acid gas, which, upon its exposure in a warm room, is gradually evolved.

The annual meeting of the Post-Graduate Dental Association of the United States will be held at the Chicago College of Dental Surgery, Chicago, Wednesday, June 25, 1890. The profession generally are invited.

R. B. TULLER, Vice-President.

The next meeting of the National Association of Dental Examiners will be held in Excelsior Springs, Mo., on Monday evening, August 4th, at 8 o'clock, and at other times during the week, between the session of the American Dental Association. It is important to have every State Board represented.

FRED. A. LEVY, D. D. S., Secretary.

The twenty-second annual meeting of the Georgia State Dental Society will be held at Gainesville, Ga. July 9, 1890. All delegates to the Southern Association are cordially invited to meet with us. Very respectfully,

ATLANTA, Ga., May 15, 1890.

L. D. CARPENTER, Cor. Secretary.

LA ESPERANZA, Honduras, C. A., April 25, 1890.

To the Editor of the Dental Review :

DEAR SIR.—I read with pleasure "Looking Forward," page 1, DENTAL REVIEW, January, 1890. Allow me to say that if I mistake not, I heard the word pronounced just before the clash, which word was lost to Dr. Rodrigues Ottolengui. It was "paper," not necessarily "all linen."

H. D. Justi will furnish the paper *pulp* which the dentist will mix with silica (?) (assorted colors) and some peculiar varnish. This will not be "warmed," but inserted at ordinary temperature will be *non-conducting, indestructible*, and will take a fine polish, becoming very hard.

H. D. Justi will, I think, exhibit samples at Chicago, World's Fair, 1893.

Yours truly,

O. A. RICE.

A rival to caffein as a muscle-bracing and stimulating drug has been found in kola. Professor Haeckel, of Marseilles, admits the virtues of caffein, but he says those of kola are greater. He used it in the food of members of an Alpine Club, who performed mountaineering feats of an unusual kind without being tired. The colonel of the 160th Regiment at Perpignan, dosed by the professor with kola, made the ascent of the Canigou Mountain, near Perpignan, to a height of 6,137 feet, and felt quite fresh after his climb, which lasted twelve hours. He only halted once, and for twenty minutes, and ate nothing. The 124th Regiment was able last July to accomplish a march of fifteen and a half hours from Laval to Rennes under similar conditions. They covered a distance of seventy-two kilometres, and were able to go much further in the last hour. They walked at the rate of three and three-quarter miles an hour. Kola is better than oats for giving mettle and staying power to horses. Perhaps (remarks the Paris correspondent of the *Daily News*) the fasting men have got hold of alkaloid of kola, of which a very small quantity goes a long way.—*Exchange*.

The following is a correct list of the incorporated dental colleges and infirmaries in the State of Illinois up to May 14, 1890 :

*An Act to incorporate a Dental College in force March 12, 1869.*

SECTION 1. *Be it enacted by the People of the State of Illinois represented in the General Assembly :* That Horace White, Allan N. Towne, Thos. Drummond, Francis Munson, Robert Collyer, Geo. S. Bowen, George Hibben, Robert L. Rea, Samuel B. Noble, John B. Rice, George H. Cushing, Robert C. Hammill and their associates and successors *forever*, according to such by-laws as may be adopted by the corporation, shall be and are hereby made a body, politic and corporate, under the name and style of "The Chicago Dental College" with all the rights, powers, privileges and authority of corporations, for the purpose of establishing and maintaining a Dental College and Dispensary in the County of Cook and the State of Illinois ; and to that end said corporation may contract and be contracted with, convey and receive conveyances, receive and make obligations, and have a common seal, or act without one, receive and use donations and endowments, acquire, dispose of, deal with and hold real estate and personal property, and otherwise act in that behalf as natural persons may do.

2. Said corporation may provide, by by-laws, to be adopted by a majority of the corporators, for trustees or directors, for officers and agents for a DENTAL COLLEGE and faculty thereof, for the instruction of students in dental medicine and surgery, and for the conferring of degrees, for income, revenues, endowments, and all such other matters and things as may seem expedient to promote the objects of the creation of said corporation ; and such by-laws may be afterward changed by a majority of the members of the corporation, if they should think expedient.

3. This statute shall be deemed a public act, and shall be in force from the date of its passage.

Approved March 12, 1869.

American College of Dental Surgery. Incorporated November 6, 1884. Incorporators, James E. Ryan, M. D., T. Davis Fitch, M. D., J. M. Cooper, T. S. Haffaker, M. D., and C. F. Eshbaugh, D. D. S.

Chicago Post Graduate School of Prosthetic Dentistry. Incorporated March 16, 1889. Incorporators, L. P. Haskell, E. J. Woodward and M. Stout.

Chicago College of Dentistry. Incorporated September 14, 1889. Incorporators, H. C. Magnusson, D. W. Richardson and J. P. McDowell.

Chicago Dental College. Incorporated August 9, 1878. Incorporators, C. T. Parkes, W. S. Haines, J. H. Etheridge and H. M. Lyman.

Chicago Dental Infirmary. Incorporated February 20, 1883. Incorporators, G. W. Nichols, T. W. Brophy, F. H. Gardiner, A. W. Harlan and E. S. Talbot. (The name of the above institution was changed to the Chicago College of Dental Surgery June 30, 1884.)

Chicago College of Dental Surgery.

Dental Department of the Northwestern University, Chicago. Incorporated June 15, 1887. Incorporators, A. E. Baldwin, Chas. R. Baker, J. S. Marshall, A. B. Freeman, Chas. P. Pruyn, R. F. Ludwig, L. P. Haskell and E. S. Talbot. (The name of this corporation was changed to the University Dental College March 9, 1888.)

University Dental College.

American and European Dental College, Chicago. Incorporators, John G. Lunn, Julius H. Lee and August Valentine.

German American Dental College of Chicago. Incorporated February 27, 1888. Incorporators, F. W. Huxmann, Geo. J. Schaller, M. D., and John L. Irwin, M. D., C. M.

Illinois Dental College, Chicago. Incorporated July 3, 1885. Incorporators, A. C. McChesney, T. C. Duncan, W. M. Tomlinson, Jos. Genett, W. N. Low, A. B. McChesney, A. J. Jutkins, H. W. Dryer and J. C. Richberg.

Northwestern College of Dental Surgery, Chicago. Incorporated October 2, 1885. Incorporators, H. C. Magnusson, J. P. McDowell, I. Clendenin and F. H. B. McDowell.

North Chicago Dental Infirmary, Chicago. Incorporated Nov. 21, 1887. Incorporators, Geo. S. Smith, W. Zeno and C. H. Adams.

Northwestern Dental College, of Chicago. Incorporated Dec. 15, 1887. Incorporators, L. E. Ireland, John Leggett and Chas. T. McKenney.

University College of Dental and Oral Surgery, Chicago. Incorporated Jan. 7, 1887. Incorporators, R. F. Ludwig, Chas. P. Pruyn, J. S. Marshall, J. F. Austin, E. S. Talbot and A. E. Baldwin.

United States Dental College, Chicago. Incorporators, W. H. Prittie, H. J. Reynolds and J. D. Robertson, (Papers not completed.)

Illinois Dental Institute, Chicago. (Date of incorporation unknown.)

Illinois Dental Hospital and Infirmary, Chicago. Incorporated Dec. 12, 1887. A. M. Rivenberg, Chas. F. Moe, Oliver Milham.

Northwestern Dental Infirmary, Chicago. Incorporated Oct. 17, 1887. Incorporators, R. R. Landis, E. C. Crawford and H. C. Magnusson.

Metropolitan College of Dental Surgery and Infirmary at Chicago. To inaugurate a better system of teaching dental surgery. Capital stock, \$5,000. Incorporators, A. M. Rivenburg, G. F. Schaefer and W. F. McWhinney.

#### DENTAL SOCIETY OF THE STATE OF NEW YORK

The following are the officers elected for the current year: President, W. W. Walker, New York City; vice-president, G. L. Curtis, Syracuse, N. Y.; treasurer, H. G. Mirick, Brooklyn, N. Y.; secretary, H. T. Van Evert, Brooklyn, N. Y.; correspondent, R. Ottolengui; board of censors, Wm. Carr, New York; Wm. Jarvie, Brooklyn; E. C. Baxter, Albany; W. H. Colgrove, Johnstown; S. B. Palmer, Syracuse; A. M. Holmes, Morrisville; Frank French, Rochester; A. P. Southwick, Buffalo.

#### HOW IS THIS?—LETTER TO A DENTAL COLLEGE PRESIDENT.

FREMONT, Ind., May 14, 1890.

MR. PRESIDENT: *Dear Sir.*—I am a minister of the gospel, and belong to the Michigan Conference of the Evangelical Association. I have worked at the dentistry for near twenty years, but I have no diploma; and now the law says I must have one: and being sent by conference from one State to another, I have lost my residence, so they say. If you can send me a diploma so I can work all right I will send you \$100. I find a great deal of extracting to do, and I would like to work some at it. I thought I would ask what you can do for me.

My address is  
Box. 273.

REV. J. SCHMAUS,  
Fremont, Stuben Co., Ind.



## AMERICAN DENTAL ASSOCIATION.

The thirteenth annual session of the American Dental Association will be held at Excelsior Springs, Missouri, commencing Tuesday, August 5, 1890, at 10 o'clock a. m.

GEO. H. CUSHING, Recording Secretary.

## IT WAS A FATAL SWALLOW.

PORTLAND, Me., April 22.—Lorestine Hinkley, of Madrid, died to-day from the effects of a recent operation for the removal of two false teeth on a metal plate that he had swallowed. He lived eleven days.—*Exchange*.

## N. J. STATE DENTAL SOCIETY.

The 20th Annual Session of the New Jersey State Dental Society will be held at the "Coleman House," Asbury Park, commencing Wednesday, July 16th, and continuing through the 17th and 18th. The State Board of Registration and Examination in Dentistry will convene for examination of candidates on Tuesday, July 15th, at 10 A. M. Hotel rates will be reduced to \$2.50 and \$3.50 per day. Programmes will be mailed to those applying during June.

CHAS. A. MEEKER, D. D. S., Sec'y.

## SOUTHERN DENTAL ASSOCIATION.

All railroads connected with the Southern Passenger Association, the Trunk Line Association and the Central Traffic Association will carry dentists and their families to Atlanta, Ga., and return at the rate of one and one-third fare for the round trip.

For this offer to be available, full fare must be paid at the starting point to Atlanta and a certificate secured from the agent at that place. On this certificate being countersigned by the corresponding secretary, Dr. D. R. Stubblefield, at Atlanta, the agent there will issue return ticket at one-third rate.

*Notice*.—No refund of fare can be expected because of failure to secure certificate at the starting point.

## THE PROGRAMME OF THE ODONTOLOGICAL SOCIETY OF INDIANAPOLIS.

May 13.—"How to Manage Nervous Patients," Dr. W. S. Rawls. "Regulating Devices," Dr. H. S. Hicks.

May 27.—Extra session. "Plastic Surgery of the Mouth," J. H. Oliver, M. D. "The Durability of Porcelain Work," by Dr. E. W. Anderson.

June 10.—"Pyorrhœa Alveolaris," Dr. A. J. Morris. "Electro-Deposit Plates," Dr. O. F. Britton.

July 8.—"Why Should not Plate Work be more Profitable?" Dr. J. B. Morrison. "Complications of Trigeminal Nerve," Dr. R. T. Oliver.

August 12.—"The Use and Abuse of Amalgam," Dr. Morris Albrecht. "Non-Surgical Diseases of the Mouth," Dr. U. L. Blu.

The following speaks for itself:

## PROFESSIONAL DIGNITY.

The men engaged in the mechanical operations of cleaning, plugging and pulling teeth are holding a State convention at Springfield. They are very severe on the members of their craft who resort to the vulgar practice of advertising. One speaker declared that "advertising lowered the dignity of the profession and fostered quackery." All his hearers acknowledged that such was the case.

Perhaps it would be a good thing to have the dignity of the profession lowered a little. It costs a great deal to support it, and the majority of people who want to have their chewing apparatus repaired, cleaned, and put in good working order do not think it pays. They object to so much dignity. They want some mechanical work done, and are willing to pay a fair price for it. They are willing to hire a dentist by the day, or to contract for a job, but they do not want to contribute a cent to support professional dignity.

If dentistry is a profession it takes its place at the foot of the list. Many think it should be classed among the trades. It requires less skill to plug a tooth than to repair a watch. But as watch cleaning is a trade the man engaged in it has no professional dignity to support. He accordingly advertises if he wishes to increase his business. He will also state how much he will ask for doing a certain job. The professional dignity of a dentist, however, prevents him from doing this.

Much is said about the cost of supporting royalty in monarchical countries. But the people of the United States pay more for supporting the dignity of the alleged profession of dentistry than the people of Russia do for supporting the dignity of the royal family. Most persons would like to dispense with so much dignity, pomp and circumstance and have their dentists' bills reduced about 75 per cent.—*Chicago Herald*.

#### A WORD FOR THE DENTISTS.

*Editor of The Herald:* In *The Herald* of Friday appeared an editorial entitled "Professional Dignity," which is a severe blow at one of the most honorable of all professions—dentistry. It may seem to many who are familiar with the great and rapid progress of oral surgery to be a work of supererogation upon my part to attempt to establish its right to be ranked with the highest of the humanities—*Si queris monumentum circumspice!* But the editorial by its pungency is liable to mislead. Is it not a well-known fact that the world owes to dentistry that greatest of all discoveries—anæsthesia—which was freely given to the world? Does that look like trading? Is it not well recognized that the science and art of dentistry have together relieved the world of some of its most formidable maladies? Is it not without dispute that the latest and best developments in histology, in biology, in bacteriology have been the work of dentists? Is it not recorded that the highest medical and surgical organizations have made oral surgery a prominent section in all their deliberative assemblies? I am astounded at the sweeping assertion that "it requires less skill to plug a tooth than to repair a watch." One would be led to think from such a remark that the author of it had indeed formed his estimate of dentistry upon his experience with those journey-men tooth carpenters of which he believes the whole profession to be composed. Can any rational person compare the manipulation of the lifeless metal that enters into the composition of even the most delicate mechanism with that wonderful vital organ through whose labyrinthine structure pass the currents of nutrition and waste, and whose nerve communication with the general organism is so perfect that the slightest interference with it jars the very citadel of life itself? This argument could be extended *ad infinitum*, but it would be useless to do so since the work of oral surgery speaks so eloquently for itself. But there is a moral side to this question which cannot be ignored. Is there any father of a family who

would be pleased to know that the arm of every charlatan was placed about the person of his loved ones in those situations which a scientific reparation of a tooth renders so absolutely necessary? Are not the confidences necessary between the oral surgeon and his patients of too delicate a nature to fall into the hands of those Philistines who auctioneer their wares with blatant impudence about the camps of science? I, for one, believe they are. I am not a dentist myself, but I know what dentistry is and what it is destined to be, and I am sure that every honorable man and virtuous woman will bid godspeed to every effort to elevate the dignity of this noble profession.

T. O. SUMMERS.

#### DEFENDING DENTAL DIGNITY.

*Editor of the Herald:* I am surprised to see in the editorial columns of the *Herald* an article casting a slur upon the profession of dentistry. As long as dental work is performed upon living structures it cannot be called strictly mechanical work, although it calls for mechanical skill of a high order. The comparison which is made is absurd. Let a watchmaker endow the works of a watch with life and feeling and place them in a remote part of a person's mouth, and he would find a task which would be an impossibility. According to the ideas advanced in the article, any one with sufficient skill to saw off a piece of wood, or cut a slice of beef, is perfectly competent to perform operations in surgery, another merely mechanical art. In regard to the cost of dentistry, there is nothing so cheap when we consider the amount of use we make of our teeth. The average man spends about ten times as much upon his barber as upon his dentist. The expenses of living, clothes and amusements are met as a matter of course, but there is a terrible outcry at spending a little upon those faithful servants of ours, the teeth. Let any one divide the amount spent upon his teeth by the number of years they are expected to do duty, and he will candidly acknowledge there is no bill so moderate and reasonable as the dentist's. As to advertising, there are about 500 licensed dentists in Cook County, and a glance at the dailies will show about ten to fifteen advertising regularly. The fact speaks for itself; and I would like to ask, to whom will people go in the hour of distress, suffering for relief and assistance? Why, to the reputable, able and conscientious men who believe in the "dignity of the profession"—a profession which is making giant strides in the elevation of a noble art and the relief of suffering humanity. Yes, dentistry is a profession, and not by any means at the foot of the list, as time will show.

A PROFESSIONAL DENTIST.

#### HE TAKES CARE OF THE CZAR'S TEETH—DR. MARINI IDENTIFIED AT MINNEAPOLIS AS THE ROYAL COURT DENTIST.

For the last seven months there has been living very quietly in Minneapolis a gentleman who has had the honor of a personal acquaintance with the Czar of All the Russias for the last eighteen years. That gentleman is Dr. George C. de Marini, an Italian by birth, an American by education, and by adoption a Russian and royal court dentist to the Czar and his family.

Dr. de Marini has been living in Minneapolis with his family at his son-in-law's, J. A. Oldenburg, a young man who for the past seven years has lived in Minneapolis and is at present in charge of the foreign department of the Bank of Minneapolis. Mr. Oldenburg has a fine cottage at Minnetonka, and it is there that the distinguished dentist has been accustomed to spend his summers. He



has passed the time there quietly, has made the acquaintance of but few people, and to all but his personal friends his identity has remained a secret. It was only through peculiar circumstances that the position he holds in the court of Russia became known. It was learned that Dr. Marini left Minneapolis a week ago Friday night, summoned, it is said, by a message from the Czar. The doctor it seems, had considerably overstaid the time granted him for his vacation.

Dr. Marini has been wonderfully aroused over the recent revelations by Mr. Kennan. He said recently to a friend that he feared to remain in Minneapolis because he was so sure that Kennan did not represent the facts as they were, and he was afraid that he would do something desperate. He protested that Kennan was not fair, and that he was not picturing Russia as she is. This, it is said, is one reason—this intense love for the Czar and equally intense hatred of Kennan for making his expose—that impelled Dr. de Marini to start back to Russia. Mrs. Marini is still in the city with her son.—*Minneapolis Exchange*.

#### AN HOUR OF TRIAL.

His arm was round my shoulder laid ;  
He pressed my head against his breast ;  
I sighed, but not a word was said,  
I felt his heart beat through his vest.

The winds of May blew sweet without,  
I thought of bairns at home so fair ;  
And good man, too, wond'ring, no doubt  
(The hour grew late), I was not there.

His fingers warm upon my cheek,  
Still toward his eyes compelled my face.  
I only felt ; I could not speak,  
Fast fettered in that close embrace.

Pain-racked, sore tried, I fain would flee,  
His voice my futile struggle stilled :  
"Madame, a little patience. See?"  
I rise, I smile. My front tooth's filled.

—*American Dentist*.

#### MOTHERS WILL UNDERSTAND THIS.

The following lines have been strung together by the house-surgeon of a country dispensary. They consist entirely of the expressions used by mothers in describing to him the complaints of their infant offspring :

"'E's cutting i's teeth across the loins with a wheezing on the chest;  
We always thinks for this complaint Roosan taller plaisters the best,"

"'E's come out all into a rash ; I am sure 'e 'as the measles ;

'E's worked up'ards and down'ards, and 'is milk comes up in curdles."

"'E's a-wasting to a shadder ; I am sure everything I've tried ;

I gives 'im boiled bread and arrowroot, yet 'e's never satisfied."

"Mother says 'e's got consumption of the bowels, but I think it all lies in 'is 'ed."

"'E's got the thrush which is a-going through 'im,

So I give 'im a cooling powder, which give 'im rather a doing."

"'E's cutting 'is teeth crossways ; they ain't quite through yet.  
 'Is little 'ed swets so at night, it makes the piller soaking wet."  
 "'E's inwardly convulsed ; 'is little eyes roll so in 'is 'ed ;  
 'E's like a burning coal at night ; I can't abide 'im in the bed."  
 "'E's collecting water in 'is 'ed whilst cutting 'is back teeth ;  
 'E's got the eating diabetes, for he does nothing else but eat."  
 "' Every time 'e draws 'is breath it comes right from 'is little stummick ;  
 "'E's got the red-gum all over 'im ; 'is teeth it is what's done it."  
 "' When 'e waked the water stood upon 'is 'ed in drops, and reg'lar smoked ;  
 'Is breathing was that 'ard at night, I thought 'e must 'ave choked."

—*British Medical Journal.*

## OBITUARY.

DR. HOMER JUDD.

Dr. Homer Judd died of cancer of the stomach at Upper Alton, Ill., May 20, 1890, aged 70 years. A man widely known throughout the West, where his influence was most felt—he left his impress upon the profession wherever scientific dentistry was practiced. Dr. Judd's labors were directed to an uplifting of the status of the dental profession by broadening its culture both general and special. He was one of the founders of the Missouri Dental College and a member of the faculty for many years. He was constantly alert to institute or promote reforms at a time when the future of dentistry was so uncertain, and when all depended upon the unflagging efforts of a handful of highminded earnest men, who seem to the observer at this day to have been endowed with the qualities of the prophets of old. He was possessed of a noble character and a manner which charmed all with whom he came in contact. He was especially beloved by his pupils and confreres. The REVIEW would echo what can be best said by a journal published by lifelong friends in his own town, as the following from the *Archives* sets forth :

"Dr. Judd was born at Otis, Berkshire county, Mass., March 29th, 1820—the son of Asa and Ada Judd. Dr. Judd's father was a respectable farmer, a prominent citizen, and represented his town several years in the General Assembly of Massachusetts. Homer's education was gained in the common schools of the neighborhood and at the Lee and Worthington Academies. In 1847 he graduated from the Berkshire Medical College, at Pittsfield, Mass., and studied dentistry with Dr. Cone.

His standing as a student, both at the academies and at college was excellent, and the studious habits of his school days were maintained through life. He was always a close student, employing all of his leisure hours in acquiring knowledge of his profession and the allied sciences. In the later years of his life he reviewed his Greek and Latin studies, and acquired a knowledge of the French, German, Spanish and Italian languages, and some acquaintance with the Sanscrit. He possessed a remarkably well trained mind and a retentive memory, which served him well as teacher and journalist.

He commenced the practice of medicine and dentistry at Ravenna, Ohio ; at the end of three years he removed to Santa Fe, New Mexico, and was the first educated dentist to fill a tooth in this territory. After a short stay he returned to Ohio, and subsequently moved to Warsaw, Ill., where he practiced medicine

and dentistry for twelve years. For several years he served on the Board of Public Schools and for one year as superintendent.

In March, 1853, he married Miss Emily F. Hodgen, of Pittsfield, Ill. Three children were born to them, one son and two daughters. The son died at the age of six years; the two daughters, Misses Emma and Mary Judd and his wife survive him.

He came to St. Louis in 1861, and entered the U. S. service as assistant surgeon on the hospital steamer running to Vicksburg. After the battle of Shiloh he offered his services and was employed as one of the four surgeons charged with the care of four hundred wounded soldiers on board a hospital steamer. His labors in this connection were so arduous that his health became impaired and he was compelled to visit Minnesota for rest and recuperation. Subsequently he was appointed surgeon to the Fortieth Missouri Volunteers, and served with them at the battles of Franklin, Nashville and Spanish Fort. For some months after the close of the war he remained in the service, being stationed at Huntsville, Ala.

In August, 1865, he was honorably discharged and returned to St. Louis and entered upon the practice of dentistry. His scientific knowledge of his profession, and the lively interest he took in its advancement, soon received recognition and placed him in the front rank among the leading men of the dental profession. He recognized the position that dentistry was one day destined to occupy in relation to general medicine, and the importance of affording the students an opportunity for gaining such knowledge of the profession as would fit them for the advanced position which he foresaw dentistry was soon to take. Prompted by his zeal for this advance in dental education, he entered heartily into the movement for the establishment of a dental college founded on the basis of a medical education. The result of this movement on the part of Dr. H. E. Peebles, Dr. Judd and others, was the organization, in 1866, of the Missouri Dental College, in connection with the St. Louis Medical College, being the first dental college to form such a connection. He was appointed to the chair of "Institutes of Dental Science," and Dean of the college, which position he filled for several years. His fondness for literary pursuits, and his high estimate of the value of a good dental journal as an educator, led him to favor the establishment of a dental journal in St. Louis. In 1869 the Missouri Dental Journal (now the ARCHIVES OF DENTISTRY) was established with Dr. H. Judd as editor-in-chief. It was, perhaps, in this connection as a journalist more than any other, that the profession of this country came to know him and realize his worth. Dentistry never had a better representative in this department. As a journalist and teacher he has never been excelled. His honesty of purpose, untiring zeal and indefatigable labor for the advancement of his profession has been rewarded by placing him at the head of the profession. He was honored with the highest position in the gift of the profession, being unanimously elected President of the American Dental Association in 1869, after having filled similar positions in local and state societies. His love for scientific investigation led him to take an active part in the work of the Academy of Science of St. Louis, of which he was an active member.

Failing health in the latter years of his life compelled him to give up all literary and professional work, spending his summers in out-of-door pursuits in the mountains of Colorado. His life was serene and peaceful, and he died as he had lived, a Christian.—*Requiescat in pace.*



# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, JULY 15, 1890.

No. 7.

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## ORIGINAL COMMUNICATIONS.

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### THE INTER-PROXIMATE SPACES.\*

BY G. V. BLACK, M. D., D. D. S., JACKSONVILLE, ILL.

The inter-proximate spaces are those openings which appear between the proximating surfaces of the teeth when in position in the normal arch. These are often spoken of as the V-shaped spaces.

The teeth make contact, each with its neighbor upon each proximate surface with the mesial tooth, with the mesial surface; and with the distal tooth with its distal surface. However, the wisdom teeth have no distal proximating tooth, and therefore only a mesial proximating surface. The central incisors, both upper and lower, approximate each other by their mesial surfaces. All of the others approximate a distal surface by their mesial surfaces, and a mesial surface by their distal surfaces. The inter-proximate spaces include all of that space left open between the crowns and necks of the teeth in the skeleton; or the space bounded by the teeth on the mesial and distal, and root-wise by the rim of the alveolar process. In the normal conditions this space is entirely filled by the soft tissues of the septum of the gum, so that in the sense of emptiness there is no space whatever. The normal inter-proximate space, then, is bounded by the hard tissues. The base of the space, or the broadest portion, rests on the rim of the alveolar process, and it tapers to an acute angle at the point of contact of the proximating teeth. This contact point is very near the occluding margin in teeth of the best form and arrangement. But in poorly formed teeth, or those that are thick-necked and much rounded toward the

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\* Read before the Odontographic Society of Chicago.

occluding surfaces, it is sometimes considerably removed toward the gingival line ; in rare cases even so much as half the length of the crown. So much as this should be regarded as abnormal. The crowns of the teeth in such cases are much rounded and generally imperfectly developed. The widest inter-proximate spaces are between teeth with strongly belled crowns, *i. e.*, teeth with the occluding surfaces of the crown very broad as compared with their necks.

The average upper dental arch from the distal surface of the left third molar to the distal surface of the right third molar, and following its curve measures about five inches. If we measure the several teeth that make up the dental arch from mesial to distal at their contact points, the sum of their measurements will be the same. A measurement of the same teeth at their necks, gives an average of about three and a half inches. Therefore, the sum of the inter-proximate spaces is about one and one-half inches. This gives an average of one-tenth of an inch to each inter-proximate space. These measurements are sufficiently accurate, and small fractions are avoided. There is, however, much difference in the width of the inter-proximate spaces between the several teeth of the same denture. The space between the central incisors is larger than that between the lateral and central, or that between the lateral incisor and the cuspid. The spaces between the bicuspid are usually larger, while those between the molars are the largest of the denture.

These spaces are said to be V-shaped from base to apex, but generally they only approximate the V-form. They vary much among different dentures, and among the several spaces of the same denture. The space between the central incisors has very nearly the typical form and its two sides are alike. The space between the central and lateral, and that between the lateral and cuspid have their distal side nearly straight while the mesial side, formed by the distal surface of the incisors, is curved. All of the other spaces have both sides curved more or less. That is to say, the sides rise from the base nearly parallel, then curve toward each other until the contact point is nearly reached, when the curve is reversed and they approach less rapidly, reaching the contact point. These curves are much greater upon the mesial side (that formed by the distal surface of the teeth) than upon the distal sides (formed by the mesial surfaces of the teeth).

The form of the space from buccal to distal is often smoothly rounded, but is more generally complex. The greater number are flattened, or even present concave sides in the central part near the base and gradually become rounded as the contact point or apex is reached. The lingual and buccal margins of the space differ very materially in their curves. These differences can be well learned only from study of the space in the skeleton, and the proximate surfaces of teeth out of the mouth, and comparisons with teeth in the mouth, together with the inter-proximate gingivæ. I think that the experience of the profession shows that the forms of these spaces are not well learned from their study in the mouth alone.

It has seemed to me that the dental profession has been very slow to recognize the importance of these spaces and their maintenance in proper form, with their contents, the septum of the gum, or the inter-proximate gingivæ, in good order. The space is necessary to the health of the gingival septum and the peridental membrane; and the health of these is necessary to the health of the teeth themselves. There is perhaps no other matter in which the dentist has so continuously and persistently ignored the comfort of his patient as in the violence he has done to the inter-proximate space and the septum of the gum tissue. Although many practitioners in their individual capacity have learned to avoid this and to maintain the inter-proximate spaces in reasonably correct form and the contained gum tissue in health, they have done so from individual observation of the fact that when teeth are allowed to drop together, obliterating this space, or that when the form is at fault and the gingival septum unhealthy, their patients are usually in dire discomfort. Certainly they have not learned it from literature. It may be true that much has been gained in recent times by the greater endeavors in contouring badly decayed teeth.

Recently several very able articles have appeared relating to contouring which merit reading. I refer to those of Drs. Davenport, of Paris, and Perry, of New York (*International Dental Journal*, February and March, 1888); also one from Dr. Allan, of New York, favoring separations and face fillings, with the discussion following it, before the First District Dental Society of New York, published in the April and May (1890) numbers of the *Dental Cosmos*. In all of these the matter is argued from the stand-point of the original contour of the tooth crown. What we want in all cases is contouring for the purpose of restoring the proper form of the inter-prox-



imate space rather than contouring for the sake of the form of the tooth. I wish to express here directly what some writers seem to have been reaching after in an indirect way when they have endeavored to explain that in contouring it was not always necessary to restore the exact original form of the crown. Many times I have seen otherwise very excellent specimens of contouring for the sake of the tooth form that failed to give comfort to the patient and to preserve the tooth from further decay for the reason that the contour did not preserve the proper form of the inter-proximate space. Therefore ever after the patient was in trouble from the lodgment of food and the violence done to the gingival septum, which in turn formed a pocket for lodgment and decomposition of debris, bringing about a renewal of caries at the gingival margins. I have often thought that if, in these cases the operator had had the idea that the contour of the inter-proximate space was the more essential point, he would not have failed.

If the teeth were originally of really good form and retain strength enough to support the necessary filling, the claim that the form should be perfectly restored is sound; and it should certainly be followed out. But how many are there who can properly determine what the original form was? How many have studied the anatomy of the teeth closely enough, and possess the mechanical ability to perfectly restore the original symmetry of the lost part? Human dental anatomy has never been a study in our dental schools until I introduced it into the Chicago College of Dental Surgery two years ago; and then it had to be pursued without proper guides for the student. To-day our dental literature does not contain a careful and complete description of the surface, or the surface markings of the teeth; nor any single one of them. There is no guide presented to the student by which he is enabled to learn tooth forms with accuracy. I was especially glad to read this sentence from Dr. Harlan in the discussions of this subject before the First District Dental Society of New York: "The trouble is, gentlemen, that the dental profession \* \* \* is unfamiliar with the groundwork of mechanics. They do not understand dental technique, they are unfamiliar by practice and experiment with the shapes of the teeth, and it is in consequence of this unfamiliarity, it is in consequence of this misunderstanding of correct mechanical principles, that the miserable apologies for contour work are spread over this broad land." (*Cosmos*, May, 1890, p. 370.)

I can most heartily adopt this sentence, and wish that I could emphasize it in such a way as to call attention strongly to the facts stated, and induce every dentist to look carefully for the fault that lies at the bottom of so much of the failure in the so-called contour filling of which complaint is so justly made. Whatever the faults in practice may be, the principles of perfect restoration of form is correct wherever the original forms were good; and the trouble is in the failure to understand, and reproduce these forms. These difficulties should not continue to baffle men who are striving for the greatest good of their patients.

Now what is the most important point in contour-filling? Where do we most generally find failure to occur? If I have observed aright, and have read the observations of others aright, the greatest amount of failure is from re-appearance of caries at the margins of the proximate surfaces. Much has been said, especially by those who have opposed contour filling, about the inability of tooth substance to bear the strain of mastication on large contoured surfaces. Is this correct? I will ask each one of you for your observation and experience on this point. Do you generally see contour fillings tumbling out from failure of the strength of tooth substance, or do you much more often see failure from the re-appearance of caries about the proximate margins? Perhaps every dentist can recall cases in which the strength of walls has been misjudged, and in which the whole structure has gone to pieces with a crash, like the deacon's one-hoss shay. I saw two such of my own a few days ago—bicuspid, the lingual cusps of which suddenly gave way under a caramel after having stood fourteen years. But I think the experience of every one will be that by far the greater number of the failures are due to the re-appearance of decay at the margins of the filling on the proximate surface. Decay on the proximate surfaces always mean one of two things, or both combined: conditions of the mouth which especially favor caries, or a bad condition of the inter-proximate space. When decay occurs or re-occurs, after the age of 25 or 30, it is in most instances the direct result of a bad condition of the inter-proximate space.

In this estimate of conditions, fillings with imperfect margins must be excluded. We cannot expect fillings of any kind to stand if the excavation has been imperfectly done, if the filling material is not perfectly adapted to the walls, or if the finishing is faulty. Any of these imperfections invite a re-appearance of caries, and are

a fruitful cause of failure. Otherwise than this the bad condition of the inter-proximate space is generally due to a faulty form which invites lodgments of food and debris to undergo decomposition and destroy the inter-proximate gingivus; or the primary faulty condition of the soft tissues in which they fail to fill the space and thus leave a pocket for decomposing matters. The health of the inter-proximate gingivus is a primary requisite to the freedom of these surfaces from caries, whether it be primary caries or secondary caries, following a filling of any kind. Nature never designed that an open space should exist between the teeth. The inter-proximate space should be filled with gum tissue to the point of proximate contact. It is always so in normal conditions, and should always be so after a contour filling has been made. It is as much the duty of the dentist to see to it that the inter-proximate space is filled with healthy gum tissue, as it is to fill the cavity. My observation leads me to believe that there is a very great and persistent neglect in this matter by many operators who otherwise make very fine contour fillings.

Too frequently the inter-proximate gingivus is destroyed in wedging, or torn or cut away in the effort to get clear space for filling, or if any is left it is mutilated beyond all possibility of recovery in the process of finishing. Then after a few years the patient returns and the operator wonders why a case in which he was so careful with every detail should again decay at the gingival margin, just at the most difficult point to repair. Does he then notice that the inter-proximate gingivus destroyed in his operation has never recovered, or that there is only a little scar tissue, and that the space is habitually nasty? How many of you have been in the habit of noticing the fact that when primary decay occurs close to the gingival line on the proximate surfaces of the teeth of your older patients, just in the positions in which you find them about your contour fillings, the inter-proximate gingivus has previously been either destroyed, or so badly injured that it has not filled the space. Those of you who have not noticed this should study it carefully. Generally you will find that the proximation of the teeth was originally faulty, or has become so from some movement of the teeth, and the gingivus has been injured by the crowding of food until a permanent receptacle for debris has been formed. Study these cases carefully, the form of the contact of the proximation, and the space, together with the occlusion. The study



will teach you a good lesson on forming inter-proximate spaces, and proximate contact, in your contour work. We want a proximate contact that will not leak food in between to the extent of breaking down the inter-proximate gingivus. I will not attempt to give any rule for forming this contact—no two cases are alike, and each individual case must be studied for itself. Really no rule can be given that will be applicable to all cases. The surfaces of the adjoining teeth should always be made to fit together closely near the occluding margin and be of such a form as best to prevent food from wedging down between them. This should be done independently of the former contour of the teeth, if that contour has not been of the best. See to it that the cusps of the opposing teeth do not so strike as to force the teeth apart and destroy contact, for in this case the contoured proximate surface with its space larger near the gingival line than at the occluding surface becomes a catch basin to gather debris favoring decomposition, and is really worse than straight sides reaching to the gums which remain open. It is unwise to contour an inter-proximate space when contact cannot be maintained and occasional cases present themselves, especially when some teeth have been lost, and movement which will cause loss of contact will certainly occur. In such cases it is better to make flat fillings at once rather than have an open space that is widest at the gingival margin. However there are exceptions to the rule, these are found in cases where the integrity of the arch has been broken by the loss of teeth, or when the cusps of the opposing teeth are forcing the teeth apart. Whenever it is possible to maintain the contact it should be done and the filling will succeed if it is otherwise perfect. If cases of final loss of contact occur occasionally under seemingly favorable conditions resulting in failure after filling, it should be remembered that the same occurs in teeth that have never been filled; resulting in bad conditions of the space, and caries, late in life. The contour of the occluding surface is much less important. It may be made a thing of beauty in its lines and symmetry, or it may be merely a club ended tooth; and in either case serve its purpose fairly well.

In very many cases there is no very great necessity that the occluding surface be filled out to the original contour, provided the proximate contact is well restored. The disto-lingual cusp of the first upper molar may be cut away, making a three cusped tooth, if the remaining tooth substance be considered too frail to support it,

and the tooth will do well, but not full duty. Other teeth may be changed in form diminishing the amount of occluding surface, but in so doing a form should always be given to the interproximate space that will secure the inter-proximate tissues from damage, and thus maintain the cleanliness of the proximate surfaces. Though such teeth may not do full duty, they will be comfortable ; and will maintain the integrity of the arch.

My feeling is, that it is not necessary in this last decade of the nineteenth century to enter into any argument to maintain the statement, that spaces made between the teeth will soon close, and that the arch will contract to that extent, no matter whether they be small or great. Separation with the ordinary separating file to make room to operate and then filling flush with this flat surface, was the rule of practice when I began filling teeth. Cohesive gold, which has made the building out of these lost parts practicable, has come into general use since, and as it came in, the flat surfaces were gradually driven out. This did not occur suddenly but has come about by degrees; every step has been debated pro and con, and seemingly every phase of separation as to size, shape, and the means of rendering them permanent, has been placed before the profession by staunch advocates of the methods, but in spite of all this such spaces have continued to close, the arch has continued to contract, food has continued to crowd upon and irritate the interproximate gingivus, patients have continued to complain of not being able to properly masticate their food, until this old mode of practice has passed into practical oblivion among almost all of the more progressive men of the profession.

Still there are many men, here and there only I hope, but yet far too many, who still indulge themselves with the easier method of separations and flat fillings, complaining that by the prevailing method multitudes of failures are following great and very fatiguing labor to both patient and operator. Do not the flat fillings fail also? Does any one believe that the men of thirty or forty years ago were saving teeth better than the men of to-day? Certainly not, nor nearly so well. No, the trouble is not with the improved plan but with the execution of it ; and those who fail to execute it well, whether through want of knowledge of the anatomy of the teeth, the forms of their inter-proximate spaces, or the mechanical skill and patient industry necessary for the reproduction of the best forms for the accomplishment of the ends sought, the saving of the

teeth will be left behind in the race ; and their patients will be known among those operators to whom they apply for relief as coming from dentists who have neglected their duty.

The worst forms of this neglect, or mistreatment with reference to the inter-proximate spaces are those in which the evil has gradually grown upon both operator and patient. A case which I have under treatment now will serve as an illustration of this: The man is about 50 years old. He had fairly good teeth, but a large number of proximal decays occurred. He has been careful of his teeth apparently, to the best of his ability, and of course began having fillings made under the old rule of soft gold and separations with the file to give space for operating. This went on until most of the proximate surfaces had been filled ; not only filled once, but very many of them refilled a number of times, and each time the file was used to give more space. This plan was continued up to the time when he first came under my care, only a few months ago. The mechanical execution of the fillings has been fairly good. He has lost no teeth. But the greater number of the inter-proximate spaces are completely obliterated. That is to say, the necks of the adjoining teeth are in contact all round the arch, except the anterior lower teeth and two or three spaces in the back part of the jaw. Each time a separation has been made for room to work, the space has gradually closed. In this slow process of closure of spaces the molar teeth have imperceptibly moved forward, gradually shortening the length of the arch. The upper arch now measures a little less than four inches from posterior to posterior of the third molars; and judging from appearances, the arch must have measured fully five inches, or was of average size originally. The contraction is sufficient to materially modify the expression of the countenance, and as the gentleman is rather thin in flesh, gives the features an unnaturally pinched expression.

In this movement the inter-proximate gingivæ have been destroyed in some cases so completely that there is no soft tissue between the proximate surfaces further crown-wise than the gingival line, and even on the neck portion of the roots there must be but a mere trace of peridental membrane reaching across from the one root to the other, without a bony septum. This slight and much-crowded tissue is kept in a state of irritation by the wedging of food against it, rendering mastication very difficult and painful.



This is an extreme case, and one for which the foundation was laid in what may be considered the olden times of dentistry, and before the Arthur method of separation with its improvements and serious evils was devised; when the separation was made with the common separating file leaving flat surfaces. The Arthur method, though so very imperfect as to have passed into oblivion, was really an attempt to partially save the inter-proximate space by so cutting that the V-shape produced should open to the lingual surface leaving contact points near the buccal angle. The beginning of the treatment of this case was justifiable as being in accordance with the then prevailing method. But the continuance of that plan of treatment up to the present, in the light of the progress made cannot be justified.

I have begun treatment of this case with the view to ultimate partial remedy, notwithstanding that the age of the patient, and the extreme degree of the contraction of the arch, seem so much against success. But I do not expect to accomplish it at a few sittings, nor within one summer. If it can be done in two, three, or even five years, it is well. The plan of procedure is this: Upon examination it is found that certain spaces are particularly troublesome. Selecting one or two of these, wedges are put in, rubber strips will do, and any effective method of slow wedging may be employed; and the teeth are gradually lifted apart until a space between the necks of the teeth that is regarded as sufficient is obtained. When this is accomplished and such soreness as may have been caused has sufficiently abated, the old fillings are removed and contour fillings made that when finished and allowed to come in contact at the occluding margins of the proximate surfaces will afford good contact, and a normal inter-proximate space. It should be remembered that the object of the contour is not so much to restore the form of the tooth as to restore the form of the inter-proximate space, and give good proximate contact. Or, in other words, it is the inter-proximate space that is to be contoured, rather than the tooth. While the one leads to the other, the most important objective point should be the form of the space. Having now done four of these, two in either jaw, I am already encouraged by finding the gingival septum of gum growing up to fill the spaces.

One or two of these can be done in such an arch\*without special difficulty; but if we attempt to continue this treatment consecutively in such a case, serious difficulties will be encountered in mov-

ing the teeth. However, after some months have elapsed, giving the teeth time for thorough accommodation in their new positions, and the completion of the necessary changes in their alveoli, we may operate upon a second series of spaces as easily as the first. In this way, in the course of a few years, the difficulty can be remedied in a fair degree, and the mastication of food made comfortable. Really the most serious difficulty is to obtain a new growth of gum tissue to fill the spaces made. To this end room should be given for granulations from the beginning of the wedging, and especial care taken not to break them down in any part of the operation of filling and finishing.

Cases of this extent of contraction from the closure of the proximate spaces are rare, and I hope may be more rare in the future; but there are very many of lesser extent continually presented for treatment. Very many of these are cases of improper previous treatment. A very common case is that in which the first molar has had a large mesial cavity and has fallen forward upon the second bicuspid to such an extent as to wholly obliterate the interproximate space, and has been filled in this position, leaving a flat surface which touches the whole length of the crown of the bicuspid, or touches at the necks of the teeth only. In these cases we generally find almost continuous discomfort, or frequent pain from forcing food between the teeth in mastication. Generally these are easy to remedy, especially if the patient is yet young. A properly adjusted rubber wedge worn for a week will make a considerable space. But it is generally better to keep the wedging going continuously after it is begun by substituting a thicker wedge every second day until the space is sufficient.

The amount of space necessary to gain in these cases is often very considerable, in some instances being from ten to fifteen hundredths of an inch; and it should be pursued persistently until the proper space is attained. The soreness of the teeth, which is the annoying feature of the proceeding, usually passes away within three or four days, though the wedging be actively proceeding, and the last part, though slower, is easier than the first. In some cases it will be found that the cusps of the teeth of the opposing jaw strike into the sulci or fossæ of the teeth, being moved in such a manner as to seriously hinder the movement. In this case I have found proceedings of sufficient vigor to create enough soreness to prohibit pressure upon the teeth effective; or a very slow movement

may carry the opposing teeth with it. In other cases the anterior teeth will be moved forward instead of moving the molars backward. Ordinarily this should not deter the movement being made sufficient to gain the best form of inter-proximate space ; for after the operation is completed the inclination of the anterior teeth to return to their former position, especially as the pressure of the lips aid them, will generally be sufficient to drive back the molars and thus re-adjust the arch.

A few months ago a young lady was brought to consult me with reference to her upper central incisors. Through some neglect after the breakage of the mesial angles of the teeth they had dropped together and had been suffered to decay badly either through carelessness of the patient, or parents ; or the incompetency of the operator who for some years had been looking after the case. The teeth were strongly bell-crowned with narrow necks. When I first saw them the centrals had each lost about one-half of the width of its cutting edge, each was filled with gold and sloped from the gingival line at the mesial surface flat to what should be the center of the cutting edge, and these flat surfaces were in apposition through their full length. The laterals had dropped against the centrals and the cuspids against the laterals so that the whole front of the arch was narrowed ; and the lower incisors lapped upon one another. This disfigured the mouth and effectually destroyed the very good expression that it evidently once had. I at once undertook to restore the case to its former symmetry, and gradually widened the arch and separated the centrals sufficiently to fully restore their contour with gold ; and also the contour of the unusually broad inter-proximate space, and had the pleasure of seeing the inter-proximate gingivus very fully restored within a few months. This also restored the contour of the mouth and features as well!

These cases are among the worst forms of obliteration of the inter-proximate spaces met with in our practice. But forms of lesser note and more readily remedied are being met with continually in both the city and country. And I am sorry to say both are too often being neglected to the great discomfort of patients. The now very general practice of gaining room for filling by wedging is rapidly diminishing the number of these cases, but there are yet far too many operators who are careless in this regard. But much too often the gaining of room to operate is the end sought rather than restoration of the inter-proximate space. I have come to abominate



the expression of "wedging to gain access to the cavity," as if that was the only object. Access can generally be had without wedging, by opening the cavity properly. The object of separation by wedging is to properly form and finish the proximate surface.

It is often so easy to use a thin file and gain a little room for filling for a patient who lives at a distance, and then in finishing the filling with disks this little space is easily doubled and then allowed to close almost as quickly as the fee is pocketed. After a year or two it becomes necessary to fill the opposite surface. This is done in the same way, cutting again for room, and the inter-proximate space is so reduced as to be uncomfortable. In the event of a refilling it is obliterated so completely as to leave flat surfaces in contact to, or near the gingival line. There is no longer a reasonable excuse for this kind of neglect of duty.

Very often young people come to us who for a time neglected their teeth and perhaps have large cavities in the mesial surfaces of the first molars. When this occurs early in life the teeth move forward readily, and it frequently happens that the distal surface of the second bicuspid is already in the cavity of the molar and the necks of the teeth in contact. The molar has leaned forward and the bicuspid has moved backward. As matters stand there is no opportunity for wedging to return the teeth to their proper relative positions. I am constantly meeting with these cases as described above, which have been filled as they stood, cutting from the molar for space in which to finish the filling. The proper procedure with these is to first excavate the cavity and treat the pulp or pulp chamber if that is required. Then make a temporary filling. This should generally be of oxyphosphate of zinc. But in very large cavities, and especially those in which the pulp chamber is involved, the chamber and the bulk of the cavity may be filled with gutta-percha, as a matter of convenience in removal, and then faced with oxyphosphate against which to place the wedge. An ordinary rubber wedge may be placed between this and the bicuspid without impinging upon the gum, and allowed to separate the teeth as far as it will. Then a larger wedge may be used or the space gained may be filled out with oxyphosphate (after removing just enough of the old to gain a hold for the new) and another thin wedge used. In this manner the full inter-proximate space may be reformed and comfort restored.

The old excuse for failure to contour these teeth, *i. e.*, "the tooth is too weak to sustain the contour filling," is no longer applicable. If the tooth is so badly decayed that it cannot be made serviceable by filling it can be made good by the use of a shell crown. But having decided upon the crown it does not reduce the obligation of the dentist to contour the inter-proximate space. You may make a club of a grinding surface not resembling a tooth and it may grind food well, but if the inter-proximate space is wrong it will be uncomfortable and the adjoining teeth will soon decay. The tooth should first be placed in proper position and then the crown should be belled out to fill its proper space. The inter-proximate space is just as important, except as to the matter of recurrence of causes, between artificial crowns set on the roots of teeth as between the natural crowns. No inter-proximate space is comfortable without a healthy inter-proximate gingivus that has room for proper circulation of blood and the functions of regeneration of its own tissues and is comparatively free from injury in the act of mastication of food, or the crowding, lodgment and decomposition of particles of debris.

What I have said thus far relates to the worst cases of neglect of duty; but the same principles apply to all of the teeth. The dropping together of any of the teeth is a very serious evil, and this evil is greater between the molars or first molars and second bicuspid than between any other teeth. These teeth have to perform the heavy work of mastication, and faulty inter-proximate spaces render mastication difficult and painful, and interferes with the preparation of the food for digestion. Furthermore, the teeth in moving forward often tilt so much out of position that the proper occlusion is interfered with. The cusps no longer fit properly into the sulci, and the occlusion is rendered faulty in many ways. Indeed I have seen many cases in which the obliteration of a few inter-proximate spaces had done greater harm than the loss of a tooth would have done. It often happens that the closing of the inter-proximate space between the lower first molar and second bicuspid throws the occlusion of all the molar teeth of that side into an unnatural position, and seriously injures their usefulness. Injury always occurs from the closure of a few inter-proximate spaces in any part of the mouth, and the consequent derangement of the occlusion which results. Much has been said in the past of permanent separations. Prominent cusps fitting into deep sulci

have been depended upon to prevent movement of the teeth and other devices brought into requisition, such as building on prominences or their separations, etc. The experience of the past shows that none of these can be depended upon. Cusps wear rapidly when the extra pressure of movement is brought against them, or they are jumped from one sulcus to another and in the end the space is closed. No device has ever been so effective as the well-formed proximate surface built out with gold.

It seems to me needless to enter into further argument here to show that these spaces will close and the arch contract in the great majority of cases. Any one of long experience will be able to point to such spaces that have been held apart by prominent cusps or some other feature of the occlusion; but these are exceptions to the rule. The law is that contraction does occur, closing such spaces; and more than this the law is also, that the space if maintained, is an unmitigated nuisance.

When I undertook to write this paper it was my intention to devote considerable of it to the plans of courtouring the inter-proximate space, forms of this space, and the instruments best adapted to the purpose, and also something as to the diseases of the gingivus. But after I had begun writing and obtained an idea of the time required I was of the opinion that a paper which should call attention as strongly as possible to this subject would be more likely to be beneficial than one largely devoted to the plans of the mechanical execution of the work. I will say, however, that the ordinary separating file should no longer be used in forming proximate surfaces as it is not adapted to the work. Neither have we in the market instruments that seem to me to be well suited for it. For a good many years I have either made my instruments myself or had them made to special patterns. Some of these are in the market, but most of them are not.

Some very thin files and saws adapted to frames are now to be had that answer fairly well. The frames I am using I made myself twelve or fifteen years ago. I use the fine saws much more than the files, generally turning the cutting edge toward the occluding surface of the tooth to prevent lacerating the gum, and doing in this way most of the coarser trimming. Seven or eight years ago I had some oval surface files made which assisted in shaping the proximating surfaces of many of the teeth. A file with a flat surface is only fit for rough trimming. Finally the finer part of the



work is done with the draw files, file cut, and ground, which I have generally made myself. Instrument makers have always told me they could not sell these instruments. As to disks I but rarely use any but the rim disks on proximate surfaces, using tapes much more than disks. The ordinary disk is too liable to cut at the contact points injuring the form there before anything is accomplished toward the gingival margin of the filling. Much of the trimming about the angles may be quickly done with gum-lance-shaped, or three-edged-plug-trimmer, and with chisels.

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### PULP CANALS OF HUMAN TEETH.\*

By T. L. JAMES, D. D. S., FAIRFIELD, IOWA.

The necessity for a thorough knowledge of parts upon which our duties require us to operate, is apparent to every conscientious member of the dental profession. Due familiarity with the forms of pulp canals enters largely into achieving favorable results in operations upon many teeth.

Comparatively little has been produced in the way of literature bearing directly upon the subject of these spaces. This is true also in regard to many other anatomical spaces. It is reasonable to suppose, however, that a knowledge of the approximate extent and form of all spaces intervening between the organs and parts generally, of the human anatomy should be possessed, so as to insure a greater degree of accuracy in surgical operations. We certainly find this to be the case in operation upon the parts required of us to treat. And since pulp canal filling is practiced so extensively, it cannot but be plain to the intelligent dentist that a high degree of familiarity should be attained with reference to the spaces in devitalized teeth, at least of the normally formed ones, and of many of the modifications. There are of course monstrosities and extensive perversions which a knowledge of normality cannot overcome or render non-perplexing. However, these hindrances are not so severe as to be considered greatly discouraging in the study and in the treatment of these chambers. There can be no fixed rules formulated in explanation of the exact sizes even in teeth of the same class and of the same age, the dentine in some having developed more rapidly than in others; besides advanced age in

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\* Read before the Iowa State Dental Society.

all cases has lessened the calibers of these canals, but the general form continues proportionately very much the same; except of course where excessive irritation has been productive of rapid secondary deposits. Besides, the presence of pulp stones or the occasional extreme constricted condition of the canal adds to the interference in formulating fixed rules.

Yet there is very much to be thought and wrought out, a knowledge of the result of which is of material practical usefulness to the operation in dental practice. In the enumeration of the more important reasons why we should be in possession of a perfect understanding of this part of our work—which so often demands our attention—mention should be made of instrumentation, to know, the size and especially the shape of the instrument to be introduced, the readiest and best point to gain access, and in the manipulations preparatory to and in crowning to avoid passing beyond the limits of strength, to avoid passing beyond the necessary limits for any reason in every step in the preparation and in the filling of these canals or even prior to pulp exposure, to know approximately how near to contact with the soft tissues we are arriving. It is as expedient that we know these points as it is for the general surgeon to know when performing a surgical operation, when he is approaching nerves, blood-vessels, or any vital organ. We confidently believe that there is no better method whereby we may attain a correct understanding of the forms and peculiarities which characterize the various normal teeth, than by the simple method of preparing sections from different parts of the teeth as was long ago indicated by Carabelli, the renowned German anatomist. There has not been left to us any translation of this author's work, in explanation of his method of procedure, but from the cuts we may infer that there is to-day a similarity in following after his plans. We find, however, upon investigating this matter of forms, that from prints made of teeth as nearly typical as we have been able to obtain, that they do not correspond with plates taken from Carabelli. It has occurred to our minds that perhaps this teacher may have treated the subject from a study of teeth of the true type.

Those of you who at our last meeting listened to the discussion upon the probable and possible causation for irregularity, will remember that it was strongly intimated that in this country there are produced very few mouths of the true type, that these condi-

tions have been the result of combining different nationalities. One parent having large teeth, while the other may have had a narrowly developed arch, then, the offspring having partaken of both parents, would in many cases have insufficient space for the teeth—therefore the irregularities. While reflecting upon the probable authenticity of this, it occurred to my mind that these same conditions may have largely to do in interfering with the production of typically-formed teeth; therefore the possibility of perversion from a true type in pulp and chamber. Here are some hurriedly prepared drawings which may serve to illustrate some points in this by no means exhaustive paper, having only hoped to bring out some of the prominent features bearing directly upon the subject.

As a rule the pulp canals are indicated by the external appearance of the teeth, or in other words, the forms of the teeth are indices to the forms of their pulp canals. We find this quite so in the superior incisors and cuspids; these canals are very much alike as regards form, save in the apices toward the crowns, where those of the cuspids differ materially from the incisors; the canals in the incisors at this point being wedge-shaped—much flattened labio-lingually and deep through the mesio-distal diameter, while the canals in the cuspids are small, both through their mesio-distal and labio-lingual diameters; the centrals and laterals are more flattened at the median than at the distal aspect. These canals in the centrals and laterals enlarge labio-lingually from the extreme points in the crowns to the neck neatly and gradually, while in the cuspids the enlarging is from both directions, they may then be compared to elongated tubes from a point below this.

In the inferior centrals the order is reversed as regards size, and a material change from the superiors in form and having compressed canals mesio-distally, so much so that it is often impossible to introduce the minutest pulp instrument through their centers. The bicuspid has somewhat more complicated conditions. These have marked grooves on both the mesial and distal faces. The variety of the forms as found in the second superiors render it often difficult of treatment. Often in the cervical portion the canals of these teeth are no more than transverse fissures with small openings at either extremity labio-lingually. We often find bifurcated canals, sometimes separating the entire length from the bulbous portion, and again in other cases they are united near the apical foramen. We will take a few points in the canals of the molars, com-



paring and contrasting the superiors with the inferiors. We find in the enlarged portion a marked contrast in form. In the superiors the greatest contrast between those and the inferiors is found through and near the greatest diameter of the pulp canal. The greatest diameter of the superiors is labio-lingually, while in the lower molars it is greatest mesio-distally, or antero-posteriorly. There is greater angularity, or at any rate the angles are more numerous in the canal of the superiors than in that of the inferiors. In the superiors we usually find two or more rather acute angles in the circumference of this locality, while in the inferior we seldom see more than one, that being beneath the antero-buccal cusp, the posterior portion being rounded or quite oval. These conditions are nearly unchanged in the second and third molars, except that the chambers are of greater length as compared with their breadth, the third being more so in this respect than the second, both in the superiors and inferiors. When on taking a view from a part near where the bifurcation occurs we see no indications of their terminating at any common opening either toward the enlargement or in the other direction.

The description of the superior second bicuspid from the bulbous portion to the apex of the canal at the root, may serve as to the conditions found in the anterior buccal root, in the superior teeth and the mesial root in the *lower* molars, both as regards variety and in forms generally.

We have recently found in the examination of lower molars, especially in the first, a number of specimens in which there were two separate and distinct foramina in the anterior root, and they are frequently found where separate canals exist in the same roots, leaving the root through one common aperture. We have but touched upon a few of the points which should be placed under the heading of this subject.

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#### LEAD POINTS.\*

BY F. PEABODY, D. D. S., LOUISVILLE, KY.

In bringing the subject of lead points once more before this association, my only object is to correct some erroneous impressions that are entertained by some members of the profession in regard to them and to add some experiences I have had relative to the use

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\* Read before the Kentucky State Dental Association.

of lead in the metallic form in the apex of the canals of teeth for the purpose of effecting a cure of chronic alveolar abscess.

Some fifteen years ago I read a paper entitled "Treatment of Chronic Abscess" outside of this association. It created but little interest, and what few remarks I have seen in the dental journals on the subject, have been generally of an antagonistic character.

Some members of this Association, however, and others, have used it in the manner I suggested and have reported to me very gratifying results.

I do not know that I have ever advocated the use of lead as a *filling* for the canals of pulpless teeth. My only reason for using it at all, has been for the purpose of destroying those cases of chronic abscess which I failed to destroy in other ways.

Metallic lead is not officinal, and I know of no diseases in general practice where it is recommended or used by the physician as a therapeutic agent. It is sometimes used in surgery, but I think that is merely for convenience, being soft and easily moulded to such forms as is desired.

Lead is obtained from ore, generally galena, and is seldom found free in nature. After its reduction from the ore to the metallic form, it is found to be combined with other metals in a greater or lesser proportion. Such as iron, antimony, copper, zinc, nickel, bismuth, gold, silver and arsenic.

Through the various processes which it undergoes, many of the alloys are removed, though, it is probable, unless manufactured for a special purpose, it is never put on the market in a state of purity. I have never tried to obtain it pure. It may be that some of the alloys with which it is combined account for the effect which it produces. I at first thought it might be the arsenic, but that would necessarily be volatilized in the high heat to which the ores are subjected.

In 1851, when I first entered the profession as a student, I had often heard my uncle, and preceptor, Dr. Wm. H. Goddard, relate a case in which a hunter having had a severe attack of pain in one of his molars, removed with the point of his knife such decay from the cavity as he was able to reach, placed a buck-shot over it, and biting down, forced as much of the shot as possible into it, trimming off the remainder with his knife until there was a normal occlusion, thereby relieving the pain. I paid but little attention to it at the time, except to wonder why lead would not be a good

article to fill a tooth with. But since my interest has been awakened in the use of this article, it has occurred to me that it might have been the arsenic, which is used in combination with lead in the manufacture of shot to harden them, which produced the result, rather than the closing of the cavity, though I doubt if metallic arsenic would have any effect on the pulp of a tooth.

Surely no dentist would to-day close the cavity in an aching molar with any material without some preparatory treatment and expect it to be quiet.

In my first use of lead in root canals, I did fill the major part of them with this material; but shortly after confined the use of it to a small piece conveyed to the apex. In no case, save one, have I seen any discoloration of the tooth even when lead occupied the whole of the canal, and that was where the lead came to the cervix, and one of the zinc plastics was placed over it. This discoloration was, I think, caused by a solution of a portion of the lead from the acid contained in the plastic.

Naturally I tried to solve the problem as to what there was in metallic lead to change pathological to normal conditions. I could only infer that by some means a solution of a portion of the lead had taken place, and a salt had been formed which had changed the conditions; but on the removal of a root that had become split (two years after the lead had been introduced into the canal), I found under a strong magnifying glass, that no solution had taken place.

Next came the idea that as leaden balls in the body sometimes became encysted, perhaps nature had cast a cyst over the apex of the tooth; but I have never removed a root that had been filled with lead and found a cyst.

The thought then came that nature recognizing lead as an object of offense, aroused her energies in antagonism to its presence, and a condition of renewed activity replacing a lethargic one, the abscess was removed simply by resolution; but if this was the case with lead, so it would be with any other material.

This theory has been also destroyed by finding that lead at the apex of a canal where the foramen had been previously closed by clogging, produced a similar result.

In teeth removed after lead had been in the canals for over ten years, I have found it still in a metallic state, with no solution or change in its character excepting an increased oxidation.



I have cured hundreds of these cases of chronic abscess by this means that would not yield to other treatment, and in no case have I found any toxic or deleterious result.

Lead placed in the canals of teeth where it was not carried to the apex, or even in the pulp chambers of the crowns, has been followed by a sense of comfort and a reduction of inflammation. In former times lead was used over exposed pulps as a capping with the intervention of no other substance between the pulps and the lead, and success has been claimed for it in the conservation of the pulp. I have no doubt if lead could be so placed on the pulp as to cause no pressure and no air cavity was left under it, that it would act as a sedative and be received kindly and tolerated by nature.

Is there a therapy in lead? This has been denied, but if there is none, will some one account for its curative properties? For that lead can and does cure chronic abscess, when carefully and intelligently used, it is useless to deny, and I think I can prove this assertion by some of those now present.

It may be maintained that other materials will produce the same results. This I do not deny, only it is not my good fortune to be acquainted with them, and I have tried many.

I do not contend that lead will control the cases mentioned by running the point of the cone a quarter or an eighth of an inch through the foramen, where it will certainly act as an irritant, and by careless operators I have known this to be done. Thus the use of lead for this purpose has fallen into disrepute.

I have been asked how I will know when the point of the cone will have reached the foramen and how I am enabled to prevent it passing through. I will briefly explain my method of manipulation.

Bending at right-angles the point of a fine Swiss broach that has been carefully annealed, I examine the portion turned over and if it is too long, with a pair of scissors I cut it off to a size that will easily pass through the foramen. I then carry the broach up the canal until the point does pass the foramen. Drawing it carefully down until the hoop catches on the external part of the apex, I grasp the broach close to the cutting or grinding surface of the crown, and by a gentle turn it is withdrawn.

The part above my grasp I measure on a card from the edge, marking it with a pencil; thus I have the length of the tooth, root and crown. Next, a few fibers of cotton wrapped around a broach

are dipped into some antiseptic solution and carried up the canal until the foramen is reached. Revolving this a few times in one direction it is withdrawn and I have the size of the canal with its taper.

Selecting a piece of lead wire the right size, I reduce it to a conical shape corresponding to the taper of the canal (as shown by the cotton on the broach) by rolling it on a glass slab with a file. From the point I cut a piece about one-eighth of an inch in length. Placing this on the measure for the length of the tooth at the mark, I make another pencil mark, thus reducing the measure for the length of the tooth, as shown on the card, by the length of the piece of lead cut off from the wire.

A root-plugger as large as will pass into the canal, nearly to the apex, is now selected. Placing this on the card at the point where the pencil mark reduced the measure, the plugger is marked with ink at the edge of the card. The point of lead, being dipped into carbolio acid to facilitate its passage, is now placed in the canal and forced up by the plugger until the ink mark is on a line with the edge of the crown. And unless the piece of lead is much too large it must be carried to the foramen and not beyond. If the foramen is so small that only the point of a broach will enter it, the lead cannot be forced through.

It has been stated by some of the members of the profession in argument on this subject, that lead being a soft and yielding metal, filled the apex of the root perfectly, that it was the thorough closing of the foramen that caused the cure of the abscess, and not the material used. I can only conclude that those who use this argument have never used lead, and have had no experience with it. Their arguments surely will not hold good, for lead cannot more perfectly close the foramen than plastics, such as oxy-chloride, oxy-phosphate, and chloro or gutta-percha.

A few weeks ago I had a case of two superior first bicuspid, in the same mouth, with an abscess on each. That on the right side had a fistulous opening on the buccal surface. That on the left side was blind. Through the foramina of none of the roots could I pass the point of a broach; in fact I could not find the foramen in any of the four roots, nor could I force by pumping, or injection, fluid through the fistula over the right tooth, nor into the blind sac over the left. Cutting through the gum into the abscess on the left tooth I obtained quite a discharge of pus. The roots were appar-

ently straight, and contrary to my custom, I concluded to perforate the apex. (I say contrary to my custom, for I do not remember ever having undertaken to make an artificial foramen that I did not regret it). This I did on the buccal root of each tooth with a very small drill, not having to pass it more than half a line. Still my applications by pumping would not follow the channel from the apex to the fistulous opening on the right tooth, nor through the gum where I had lanced it on the left.

Each morning the lady came, and stated that she felt as though she had a marble on each side of the mouth, and each morning I evacuated the contents of the sacs externally, and syringed with carbolic acid through the external openings. I had kept a tent in the wound I made over the left tooth, so the opening had not closed, so I could obtain no communication through the canals. I treated steadily for a week, then filling the canals with a combination of carbolic acid in glycerine. I gave a week's rest in hopes that the application might reach the sacs and soften the contents of the closed foramina.

The lady wished to leave town and insisted that the abscesses be cured. She was waiting only for that.

I was in despair. Nothing seemed to improve them. I treated again for two or three days, and rested for another week, to give nature a chance to do something. Still no improvement. In desperation I concluded to fill all four of the roots, at the apex, with lead, and trephine afterwards if this proved a failure. This I did, completing the operation with permanent fillings of gold in the crowns. To my surprise the gum over each tooth was healed in three days, and the redness so much reduced that it was evidently a question of but a short time before it would have entirely disappeared.

I say to my surprise. I did not have much confidence in the result, as heretofore I had only treated such teeth as had fistulous openings through which I was enabled to pass my applications, until they appeared on the gum.

I prevailed on the lady to remain a few days longer to be sure that all was right, and when I dismissed her there was no swelling, no discharge, and no redness.

Would the mere filling of the canals, with such materials as are generally used, after the treatment I had given the teeth, have produced such a result? I think not, and yet I am sorry to say I am



using this lead without being able to explain how these results are brought about.

One other case and I will conclude:

A patient having a central incisor badly broken down, with a fistulous opening, presented for treatment. The root was very short. After I had exhausted my materia medica unsuccessfully in trying to effect a cure, I cut off the crown and mounted a temporary one on a wooden pivot, and so short was the root and so straight the canal that any application passed into the canal came through the fistula on its first introduction. The foramen was large. I lost a piece of cotton through it—this I readily took out of the opening on the gum. I concluded there was some irritant at the apex, and passed through the foramen a wheel bur, and smoothed it off, or tried to do so, still I could not cure the abscess. Knowing I could easily remove any filling I placed in the canal, should it prove a failure, I concluded to fill with one of the plastics; having done so, I reset the pivot tooth, which was mounted only on a piece of soft pine, and injected the opening in the gum with a saturated solution of metallic iodine in creosote, one of my *dernier resorts*.

I dismissed the patient with instructions to report in a week. This she did. No improvement. I painted the gum with iodine, dismissed for another week; result the same.

This went on for a month, when I removed the plastic filling and after washing out all debris with warm water, I prepared a cone of lead not over one-sixteenth of an inch in length. This I made very carefully as regards the size of the canal. I carried it to the foramen, and over this I placed a small portion of gutta-percha, mounting the pivot tooth in the same way again. This healed the abscess inside of two weeks, but it was slower in yielding than any case I had previously seen.

I select these two cases out of a large number, because they were more complicated than any I had met with.

I do not pretend to explain the therapeutic action of lead in this matter, if there is any, and I believe there is.

If any of the members see fit to discuss this paper, and I hope they will, for I am earnestly searching for light, I trust they will bear constantly in mind, that I am writing of *chronic* abscess only, and such as fail to yield to other treatment.

## THE USE OF DIFFUSIBLE MEDICAMENTS IN AND AROUND THE ROOTS OF TEETH.\*

BY A. W. HARLAN, M. D., D. D. S., Chicago, Ill.

From long agitation of the subject, numerous papers have been written on the disinfection of pulpless teeth and the treatment of abscesses. The writer must plead guilty to the charge that he has been one of the rank and file at work on the solution of this question, which so far has not been satisfactorily solved for all. Two or three axiomatic statements may be made in the beginning, after which we will reach the question at issue. "The dentine of a tooth with a living pulp in it, when extensively decalcified, needs to be disinfected if the cavity in the tooth is to be filled and the softened dentine is to remain as a protection to the pulp." "When a living pulp is destroyed surgically and removed from the tooth at once, the dentine of the tooth does not need disinfection further than the thorough mechanical removal of the caries in the crown." This rule will also apply to cases where destruction of the pulp is effected by the use of medicinal agents—arsenic or other corrosives. The pulp in such cases is generally removed before putrefaction begins, and hence there is no infection of the dentine. If the roots of such teeth are filled at once after removal of the pulp, there is no possibility of infection. It is in the omission of the immediate filling of such roots that future trouble may be expected from pollution of the dentine of the root. The dentine of encysted roots needs no disinfection. The dentine of teeth after complete calcification of the pulp does not call for disinfection. Thorough removal of caries from such teeth is all that is required.

The whole question of the management of pulpless teeth from the time a pulp is doomed to die cannot be gone over in this paper, but that portion of the subject which concerns the management of dentine in teeth where the pulp has died spontaneously or has been destroyed and the roots of such teeth have been left unfilled, is the field of my remarks to-day. The position that I take is this: When the pulp dies or is destroyed in the course of time it decays or putrefies. During this period noxious gases are evolved which, if they have no outlet through the apex of the root or through an aperture in the crown, must of necessity infiltrate or

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\* Read before the Iowa State Dental Society, May, 1890.

permeate the dentine of the tooth. If the putrefaction of the pulp is slow the dentine is thoroughly permeated, if rapid it is permeated only slightly, as the rapid evolution of gases will soon cause them to pass through the apical foramen, irritating, the pericementum, which if allowed to continue will generally result in an abscess. If the abscess becomes what is known as a blind, dormant or cold abscess, the gases formed will finally so infiltrate the dentine that the tooth will become discolored, and when saturation is complete the tooth will grow painful to touch and become an unused tooth; the abscess so long dormant will grow into an acute abscess, which can only be evacuated by drilling into the pulp chamber or reaching it through the gum over the point of the root. Now we will suppose that a fistula is established and pus is discharged through this from day to day. Presently the root will be cleaned and filled by a dentist at one sitting and the tooth may become comfortable to the possessor.

After the lapse of two or three years this tooth grows tender to the touch; it is sensible of atmospheric changes; there is a decided lameness of the tooth. What has brought about this condition of things? Failure to disinfect the dentine, is what I say. You know the prevalent practice has been for many years to disinfect the dentine of pulpless teeth with carbolic acid, chloride of zinc, aromatic sulphuric acid and commercial creosote. Some tinctures (all containing alcohol), and alcohol have been used for this purpose. Instantaneous disinfection cannot be accomplished with coagulators of albumen. They are self-limiting. Diffusible disinfectants are called for in these cases. Agents which will permeate the dentine and destroy mephitic gases and microbes, such as arise from pulp decomposition, are indicated to disinfect dentine. I will read a few experiments later to show what class of agents will do this. Prof. Miller in a recent paper has hinted at the thought that disinfection of dentine is unnecessary; that the sealing of the foramen of a tooth is all that is required to keep it in a state of quiet. This no doubt is true in all cases where the pulp has not decomposed within the tooth, but pass beyond the edge of decomposition, let it continue for a period and surface disinfection will not protect a tooth from future trouble. All coagula are more easily attacked by microbes than fluids or serous bodies. A coagulum is a source of danger in a pulpless tooth. This paper was undertaken to show the great value of diffusible disinfectants in



pulpless teeth or around the roots of teeth, over the coagulating disinfectants.

I will now place before you methods of making the experiments and the experiments themselves: The same agents that are so positively diffusible in dentine, are likewise valuable germicides and stimulants. The volatile camphors will penetrate substances that septic gases will saturate, and at the same time destroy odors and poisons. Do not deceive yourselves by thinking that if you pump some medicine through a root canal that disinfection is accomplished. The filling of the root will not do it. The insidious saturation of dentine is not the work of a moment, it may have been going on for years, and time must be taken to destroy this poison. Coagulants only produce surface disinfection; diffusible agents penetrate, permeate and nullify septic poisons.

The following experiments were undertaken in order to determine whether the essential oils were diffusible through dentine and cementum. The general plan was as follows: A dry tooth that had lain around the office for a year or longer, was invested in plaster-of-Paris so that it was surrounded by a thickness of one inch or more, both around the sides and beyond the apices of the roots. When the plaster hardened, the cavity in the crown of the tooth was opened, first moistening the decay, removing that from the cavity and perforating the pulp chamber with a moistened instrument, and then flooding the pulp canal with water. This would leave the tooth in a condition as nearly approximating the conditions to be found in the mouth, that is, the external covering of the root was moistened with the wet plaster-of-Paris and the interior of the tooth moistened with water, which would be equivalent to moisture that finds its way to the interior of the tooth in the mouth. The cavity was then dried in the ordinary way, not taking extra precautions to make the interior of the root thoroughly dry. A pellet of cotton was then moistened with the medicament to be mentioned later, and introduced into the pulp chamber. This was covered with a sandarac, or gutta-percha dressing. The blocks of plaster were allowed to remain on the desk (where the temperature was about 70 degrees) for three days. The gutta-percha, or sandarac, was removed, the cotton moistened with the medicament removed very carefully so as not to get any of it on the plaster-of-Paris; then a drop of the medicament, whatever it might have been, was introduced into the root of the tooth, the contents of the root

having been removed. Slender strands of cotton or silk were then thoroughly moistened with the oil or other agent, introduced into the root in the same manner that they would be, had the tooth been in the mouth, the cavity sealed as formerly, and the blocks replaced on the desk as before. At the end of one week the plaster blocks were split so as not to expose the surface of the root. In each case experimented with, the essential oils having been used, it was found that no oil stains could be discovered. As one of the tests of the purity of the essential oils is, that you may moisten a piece of blotting or other white paper and it will evaporate without stain, but the characteristic odor of the medicament remains on the plaster-of-Paris. In every instance great care was exercised not to contaminate the plaster-of-Paris before introducing the oils. This is taken to be conclusive evidence that there was diffusion of the oil through the substance of the dentine and cementum.

*Experiment 1.* A molar tooth was surrounded by a plaster block, as previously described, and into it was introduced about one drop of tereben. At the end of three days this dressing was removed, and the contents of the pulp chamber and canal also; a strand of cotton having been moistened in fresh tereben and replaced in the root, not passing the cotton to the apices, but within one-sixteenth to one-eighth of an inch from the apices. No force was used to introduce the strand of cotton. It was then covered with a solution of gutta-percha in chloroform. At the end of one week the block was split, without disturbing the sealed dressing contained in the tooth, and the unmistakable odor of tereben permeated the whole plaster-of-Paris. In this case the apices of the roots were closed before the tooth was introduced into the plaster.

*Experiment 2.* A perfectly sound tooth was surrounded by plaster as before mentioned. This tooth was one that had been extracted for the purpose of correcting an irregularity—a first superior bicuspid, the ends of the roots of which were not completely developed. This tooth was treated exactly as in the case of Experiment 1, save that the medicament introduced was 95 per cent carbolic acid. The same procedures were gone through with in every particular, and at the end of the allotted time the plaster block was split, and it was found that the carbolic acid had not penetrated through the dentine or cementum, and that there was absolutely no trace of carbolic acid by odor or gross test that might be made, thus showing that it was not diffusible and that it had

not penetrated through the dentine or cementum. No precaution was taken to close up the apical foramen, and it had not passed through even at that point.

*Experiment 3.* A bicuspid tooth, perfectly sound, was surrounded by plaster as before, and the agent that was introduced into the opening through the center of the crown was oil of camphor. At the end of three days this was removed, and the contents likewise. Then a fresh strand of cotton dipped in oil of camphor was introduced, sealed with gutta-percha dissolved in chloroform. At the end of a week this was removed, the plaster block was split and an unmistakable camphoraceous odor was apparent throughout the whole plaster-of-Paris block. In this case the block measured  $2\frac{1}{2} \times 1\frac{1}{2}$  inches and was  $1\frac{1}{4}$  inches high. In this case particular care was taken to moisten the whole interior of the dentine with water, and no extra care was taken to remove the excess of water.

*Experiment 4.* A solution of iodol was made in oil of cassia. A bicuspid tooth with one-half of the crown split off, otherwise perfect, was surrounded with plaster as before. The cavity of decay was opened and moistened with water, then dried, and a pellet of cotton dipped in the solution before mentioned, was introduced into the pulp chamber alone. This was covered with a pellet of cotton dipped in the solution of gutta-percha as before. At the end of four days it was removed, and the contents likewise. A strand of cotton was introduced into the root, about one-half its length, moistened in this solution, no force being used to carry it to that point. The hole was covered with a gutta-percha solution. At the end of one week the plaster block was split, and it was seen that the root was almost completely blackened by the solution. After the surface of the cementum had been removed with a file on both sides the starch test for iodine was made. The characteristic reaction ensued almost immediately, showing that the oil of cassia had penetrated not only the dentine, but the cementum of the tooth, and in doing so it carried with it the iodine. This experiment would seem to prove that by using a solution of iodine any essential oil may permeate the whole of the tooth; hence iodine compounds that are not stable should be kept from teeth when you do not desire to have them stained. It would also indicate that the vapor of iodine perhaps may be utilized in the treatment of blind abscesses in connection with essential oils.



*Experiment 5.* This was a third molar tooth with a moderate sized cavity reaching from the crown to the pulp chamber. The roots were dwarfed so that the three were nearly fused together. In this case the cavity was opened in the usual manner, previously wetting it with water and also the contents of the root canal, then moderately dried, not using any extra precautions in that particular, and moistened in pure wood creosote on a pellet of cotton. This was covered in the usual manner with gutta percha and chlo-roform. At the end of three days this dressing was removed, care being taken to prevent contamination of the plaster-of-Paris with the creosote or the gutta-percha covering. The root canals were cleansed and remoistened, and a strand of cotton introduced one-half the length of the root, covered with gutta-percha dressing, and allowed to remain one week. At the end of that time the block was split and unmistakable evidence of penetration of the creosote through the dentine and cementum was apparent in every particle. In this case the apices of the root were closed by encystment previous to the extraction of the tooth.

*Experiment 6.* A molar tooth with a cavity on the mesial surface and immensely large roots, was implanted in a plaster-of-Paris as before mentioned. The cavity was opened to the pulp canals. This was moistened and dried in the usual manner, and eugenol on a pellet of cotton introduced. This was covered with gutta-percha solution as before. At the end of three days it was removed, and the root cleansed, care being taken to prevent the contamination of the plaster-of-Paris as in the other mentioned cases. Strands of cotton were introduced into each root, saturated with eugenol. These were covered with gutta-percha solution as before. At the end of three days it was removed and the root cleansed, care being taken to prevent the contamination of the plaster-of-Paris as in the other mentioned cases. Strands of cotton were introduced into each root, saturated with eugenol. These were covered with gutta-percha solution and allowed to remain five days. At the end of that time the plaster block was split, and not only did the plaster give evidence of penetration of the eugenol through the substance of the tooth, but the surface of the root itself gave evidence on every side that the eugenol had penetrated both the dentine and cementum, as it had turned it a bright yellow.

*Experiment 7.* A lower bicuspid tooth that had been extracted on account of extensive deposits of salivary calculus which covered its whole exterior, including the apex of the root, was invested in plaster, the cavity of decay opened as previously mentioned, and into the pulp chamber was introduced a pellet of cotton saturated with cajuput. This was covered with gutta-percha solution and allowed to remain for three days, when it was removed and the root canal cleansed of its contents. A strand of cotton moistened in gutta-percha was introduced two-thirds of the length of the root. This was covered with a gutta-percha dressing and allowed to remain seven days. At the end of that time the plaster block was split, and the whole plaster-of-Paris gave evidence of the penetration of the oil of cajuput through the dentine and cementum. In this case the apical foramen had been closed with a deposit of salivary calculus.

*Experiment 8.* A lower molar tooth with a crown entirely removed by decay, was invested in plaster-of-Paris. The cavity was opened after being moistened with water, and a portion of the pulp-chamber contents removed also. This was re-moistened and dried in the usual manner. Volatile extract of oil of eucalyptus was used to saturate the strand of cotton, which was introduced into the openings of the pulp canals. These were covered with gutta-percha as usual. At the end of three days the dressing was removed, and the pulp canal contents removed likewise. A strand of cotton was then introduced into each root about one-half of its depth. This was sealed in the usual manner. At the end of seven days the plaster was broken, and unmistakable evidence of penetration of the eucalyptus through the whole extent of the plaster was apparent. In this case the apical foramina were closed so that the finest instrument could not pass through them.

*Experiment 9.* A lower bicuspid that was also removed on account of extensive deposits of salivary calculus was invested in plaster, the cavity on the mesial side opened, previously moistening it with water, the contents of the pulp-chamber were removed, a drop of the oil of cassia was introduced on cotton, and the cavity sealed in the usual manner. At the end of three days the dressing was removed and likewise the contents of the canal. The interior of the root was then re-moistened with water, dried in the usual manner, and a strand of cotton introduced about one-third the length of the root, using no pressure, and sealed as formerly. At

the end of seven days the plaster-of-Paris was split from the root, and unmistakable evidence of the penetration of oil of cassia by its odor was present in the plaster-of-Paris, which was also tested for the presence of cinnamic acid. This was found to be present in the plaster-of-Paris.

*Experiment 10.* A perfectly sound lower bicuspid tooth was immersed in plaster-of-Paris in the usual manner. A hole was bored through the sulci, moistening the point of the instrument with water as it approached the pulp chamber. On reaching it the interior of the cavity was flooded with water, when the excess was removed and 95 per cent carbolic acid was introduced on a pellet of cotton into the pulp chamber; this was sealed with sandarac varnish on cotton. At the end of three days the dressing was removed and the shriveled remains of the pulp also. A fresh strand of cotton was moistened in a 95 per cent solution of carbolic acid, introduced two-thirds the length of the root, sealed with gutta-percha and allowed to remain one week. The plaster was then split from the sides of the root and no odor of carbolic acid was to be found in the plaster-of-Paris. In this case no precautions were observed to close the apical foramen.

*Experiment 11.* A sound lower incisor tooth was invested in plaster in the usual manner. A hole was bored into the pulp chamber from the crown, keeping the instrument moist with water all the time. In this case the remains of the pulp were removed as thoroughly as possible. Ninety-five per cent carbolic acid in water was introduced on a pellet of cotton, the cavity sealed with gutta-percha solution. This was allowed to remain three days, at the end of which time the plaster-of-Paris was split from the sides of the root, and I was unable to determine the presence of carbolic acid by smell or any other test.

*Experiment 12.* In this case a perfectly sound third molar tooth was invested in plaster, and after hardening, a hole was bored through the center of the crown to the pulp chamber. This was thoroughly moistened, the cavity moderately dried and a drop of the oil of cajuput was introduced into the pulp chamber on a pellet of cotton. This was covered with gutta-percha solution and cotton and allowed to remain three days. At the end of that time, and even previous to the splitting of the plaster-of-Paris through and around the root, the odor of oil of cajuput was perceptible on the under surface of the plaster block. After splitting it every particle within



the third of an inch away from the root was found to be thoroughly permeated. In this case the apical foramen had been closed by a sac, which was adherent to the apex of the root, and the sac had not been removed.

*Experiments 13, 14 and 15.* Three teeth were selected for these experiments and were invested in the plaster-of-Paris two inches apart, making the block about eight inches in length. The plaster was about one and one-half inches thick, so that there was a sufficient quantity surrounding each root to render it impossible for one medicament to contaminate the plaster-of-Paris around the adjacent or neighboring tooth. In the central tooth that was implanted in this block of plaster, was introduced 95 per cent carbolic acid, having bored a hole into the crown of the tooth in the usual manner and moistening the cavity with water. This was sealed with gutta-percha. At the left end of the block eucalyptol was introduced into the pulp chamber and sealed with gutta-percha.

At the right end of the block eugenol was introduced after boring a hole into the central cavity of the tooth, and it was sealed. At the end of six days this block was split. It will be noticed that in this case the medicament was only introduced a single time. No precautions were observed to close the apical foramen in either of these teeth, but they had long lain in a drawer in the office, so that most, if not all of them, were from one to two years of age. On splitting the block where the eugenol had been introduced into the tooth, it was found that the root presented the characteristic oleaginous appearance previously described in experiment 6, and the odor was unmistakable for one-half or three-quarters of an inch beyond the periphery of the root. The plaster was then split around the tooth containing carbolic acid, and the odor was not perceptible until that portion of the plaster was reached, around the apex of the root. In this case it was observed that the apical foramen was open, and that the carbolic acid must have percolated through the opening at the time when it was first introduced. In this experiment the teeth were placed on their crown ends to simulate the position of upper teeth. In the third tooth, which contained the eucalyptol, the characteristic odor of the volatile extract of eucalyptus was found in the plaster-of-Paris at a distance exceeding one inch from the surface of the root.

These are all the experiments that I shall report, although others have been made to corroborate the statement that the oils

particularly are diffusible not only through the dentine but through the cementum if they are allowed to remain sufficiently long in contact with the central canal of a tooth and are properly sealed therein.

It follows from these experiments that if there be pollution of dentine from putrefactive gases we must use agents in the canals of teeth to destroy such gases. Coagulating disinfectants cannot be relied on to disinfect dentine, as they do not diffuse through it, hence agents, such as potassium permanganate, Labarraque's solution of chlorinated soda, sodium fluosilicate and the essential oils of peppermint, cinnamon, cassia, cloves (eugenol), eucalyptus, thyme, myrtle, cajuput, etc., should be used. Agents of this class are indicated as stimulants around the roots of teeth, which have become loosened by disease. They may be combined at times with each other and occasionally with coagulants, as we seek to produce irritant or destructive effects in connection with stimulating medicaments. The whole question of the handling of pulpless teeth after the putrefaction of the pulp within the tooth hinges on First, the application of diffusible agents into the pulp-chamber for a period of three or four days. Second, the removal of the contents of the pulp-chamber and canal with the rubber dam in place. Third, the introduction of such agents into this class of teeth for a period of one week, always sealing the cavity of decay with gutta-percha. Fourth, the removal of the dressing without allowing moisture to get into the tooth from the mouth and the desiccation of the root as nearly as it is possible to accomplish it. Fifth, the filling of the root with gutta-percha, paraffine or other non-porous substance.

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## PROCEEDINGS OF SOCIETIES.

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THE IOWA STATE DENTAL SOCIETY, MAY 6, 7, 8 AND 9, 1890.

AFTERNOON SESSION, TUESDAY, MAY 6, 1890.

DISCUSSION on the President's Address :

DR. L. C. INGERSOLL, Keokuk : I am pleased with the address of the president in this respect : that we have had a paper on the practical side of dentistry. Every science has theoretical doctrines, but it also has practical aspects. Our president has made no pretention to being a theorizer, but has only made pretentions to being

a practical man, and has demonstrated most fully the practical nature of his work and of his mind. His thoughts are, therefore, very valuable for the practical student—very valuable indeed. I was much pleased with that portion relating to local anæsthetics because the thought expressed is the same line of thought of my own paper on that subject. It deserves our careful attention. With the use of nostrums that are put upon the market, I think we are far from professional; it can hardly be considered professional for a man to work in ignorance; it is not scientific for a man to work in ignorance on any point. Any man who handles instruments that he knows nothing about is blundering all the way through and makes mistakes. One competent to use them, says: "You are not using that right; that is the reason you cannot make it a success." It is just so with regard to the practice of dentistry, and especially in the use of medicaments. I, as I said at first, was interested in the fact that it was from a practical standpoint. The success which he has intimated in dentistry here is a success which he himself has demonstrated to-day in the matter of bridge-work. We know there is a variety of opinions; that the profession is largely divided on the utility of bridge-work. He thinks from the standpoint of his own practice, and in his case it has proven a success; but the question is whether on the whole the world has been bettered up to this time. What may be the future of his work no one can tell, but up to the present it is a question of doubt in my mind whether bridge-work has not been worse; been a disadvantage rather than an advantage. I am pleased with his idea with regard to the use of all those medicaments which are designed in the treatment of sensitive dentine. We ought, in all cases, to understand their nature and their effects or else let them alone.

DR. C. J. PETERSON, Dubuque: I was waiting to listen to some one of more experience discuss the paper. It certainly made me think, and think hard, that there was an appeal all the way through for a higher standard of dentistry, and this will make dentists think what is to be done for the benefit and advancement of the profession, and they have pointed out the dangers we are floating into gradually, not only through medicaments, but improper work. He also touched on a point—a dangerous point to touch on—that of dental colleges, and I think that the advance that has been made to increase the length of the term is a good thing, and if there are too many colleges they certainly cannot get the best talent in all of



them, and if they are restricted, as there has been an attempt in this State to restrict them for other schools and call them colleges, they may be preparatory schools. So all the way through it is throwing out the danger signal, and it made me think more seriously than I had before where we are drifting—actually drifting—and that some day we will run against something. I am very much pleased; pleased that we have a president who could give us a practical paper with a good deal of science in it too.

DISCUSSION—"Pulp Canals of Human Teeth," by Dr. T. L. James, of Fairfield, Iowa:

DR. I. P. WILSON, Burlington: These charts are worthy of very careful examination, especially to those who may not have given the matter the attention it deserves. Regarding the number of canals in the roots I am simply taking this diagram before me now that I believe represents, as I understood the speaker, a cross-section of the tooth just above the bifurcation of the roots. That is really an able drawing in this respect. When we come to fill a tooth of that kind we are too apt to feel satisfied if we have a two-rooted tooth with a filling in one canal. We find an open canal in the posterior root, for instance; we pass our nerve instrument down thoroughly in the root and we proceed finally to fill that root, and I am satisfied that very often we overlook the fact that one root contains two canals, as I find so nicely represented here, so we fill one of those canals, the posterior and the anterior, and the result is we leave two canals entirely unfilled.

DR. A. O. HUNT, Iowa City: I believe this subject is one of exceeding importance to each individual. The drawings are very good representations indeed, of the conditions of canals and pulp chambers and the variations that occur in different canals in teeth of the same type or the same class, and I believe the paper was of special interest to us so that each of us may prepare these sections in the way that Dr. James has presented them and study the subject individually. There is much to be found out by it; much more than perhaps would seem at first thought or first glance. In his reference to the origin of the work referring to Carabelli, who undoubtedly examined minutely the anatomical construction of the teeth as well as he did other parts of the human anatomy, but he made a special writing on this subject and has given some most excellent drawings and cuts. The book was published in 1840, and I can agree with the writer of the paper that while the teeth as we find

them now—a preparation that we may make from teeth that come to our hand would not be duplicates of those cuts. I think the reason given by the writer would be a very correct one, but the types of teeth change as well as types of jaw, types of faces, types of the general form of the individual, changes from the nominally different race types. Carabelli had the German race where there had been for a long time little or no change; at least, time enough had elapsed for the nation to have a typical form, and that was undoubtedly represented in their teeth, and it undoubtedly accounts for the uniformity represented in the cuts given by him. And it could hardly be possible for us to find any such uniformity as that in the study of the teeth that we might prepare; and hence, this subject is of more importance for the reason of the change of type; at least, we have no American type; that question is certainly clear enough to us at this time. We certainly do not have typical American teeth, hence it seems to me more important that each individual operator should study the subject of its character for himself, as every day we are called upon to get access to and fill these canals and spaces, and certainly we cannot know too much about them, at least too much about the variations, and we will find the variations are more common than the normal conditions. I consider it a very able paper for this society.

DR. J. T. ABBOTT, Manchester: I have much to think about, and my thoughts have been wandering in that direction since the reading of the paper. Perhaps there is nothing more difficult to satisfy ourselves with than in preparing the pulp cavity for filling, whether it be the teeth entire except the decayed part, or whether it be the teeth in preparation for a crown. We many times think that we are at the apex of the root when there is a change in the tooth that we cannot possibly know but little about; we cannot understand it; we cannot comprehend that we have not got to the apex of the root. Now, I know of many practitioners, and especially the younger ones that will tell us that they know the exact point when they have reached the apex, or foramen of the root; they will tell us they know exactly; they will tell us their experience is such that they cannot be mistaken. I must confess that my experience is not of that character; the more I learn of these things in regard to pulp cavities the less I find I know, and the more blunders I have made in years before. Although I have had reasonable success in the preparation of these cavities, yet I am

satisfied it was more from the tooth's preparing, or from nature's taking care of the matter than from any close observation of my own. Now, this is quite an admission; I am aware of that; perhaps the rest of the practitioners would agree with my not being satisfied when they had reached the apex of the root. I have had cases where I have gone through the usual process of destroying the pulp, and this is one type of the many I have had. I have found that when I had approached perhaps nine-tenths of the length of the canal, or perhaps further, there I found a sensitiveness, and it seems sometimes almost impossible to do away with that sensitiveness before filling.

This is perhaps not germane to the subject of the paper. I only speak of that point to say how necessary it is for us to continue, as Prof. Hunt says, to study each individual to learn for ourselves in the preparation of these root canals before filling.

DR. C. J. PETERSON, Dubuque: A year or two ago Dr. Abbott had occasion to say, when I read a little paper, that he had a paper up at the hotel that was something in the same line. While sitting here these same thoughts that he talked about were running through my mind. I do not know how he got them. In thinking over the subject, in getting at a root canal, it is very difficult, especially in the posterior teeth, and I know I have run up until I struck the bottom at the end of that root. Now we do not know, I think, in three-fourths of the cases whether we are at the end of the root or not, as Dr. Abbott has said. It is very difficult to get at the buccal roots of the upper molar. Then I have never thought of it as much as in regard to the wisdom teeth. Sometimes we see them perfect. They, of course, have not such tortuous canals. When we try to fill a tooth or root we ought to look at the case and see whether the father was a Scotchman or the mother was a Frenchwoman and see what teeth they had. In that case we will be surer to find whether we are at the apex of the root or not.

DISCUSSION on "Local Anæsthetics and Pain Obtundents."

DR. J. T. ABBOTT, Manchester: Have we any knowledge, as a rule, of the effects of the many nostrums that are thrust upon us and we are using for the obtunding of pain and local anæsthesia? It is remarkable how little knowledge we have of them. We are endeavoring to do too much with something we have very little knowledge of; taking the word of individuals who know as little about the action of the drug they urge upon us as we ourselves,



and which we buy, hoping to gain a little reputation for ourselves in the painless extraction of teeth, and thus satisfying our patients. Now, in many cases, I, and doubtless others, have often fooled the patient; I remember hearing of a lady—not a practitioner—who sometimes when her husband is absent alleviates the pain of the patient having toothache. The lady not knowing the nature of the drug her husband uses in this particular case, adopted the plan of taking in her hand a little cold water and saying: “I think this will relieve the pain very much;” use a drop on a piece of cotton and places it in the tooth; “I am confident it will,” and applied, it certainly does relieve in a little while. I do not care what it is, any substance that will not harm the patient, if we can work on the imagination, will give relief.

DR. T. L. JAMES, Fairfield: I would like to ask Dr. Ingersoll a question or two about this paper—some of the substance therein with reference to the termination of the nerve fibers. What action local anæsthesia has. I understand he intimated that it paralyzed the peripheries, or terminal points of the nerve fibers, in both the soft and hard tissues, and there is no absorption by the blood—nothing unusual?

DR. INGERSOLL: I did not say nothing enters into the circulation of the blood. I do not apprehend that causes the anæsthesia.

DR. JAMES: It has no physiological effect?

DR. INGERSOLL: No.

DR. JAMES: Now, if I understand the nervous system correctly, it coördinates with all the tissues of the body at all times in such a way as that it brings the individual into conscious relationship with all its external objects through various means. If that acts on the periphery nerve, there must be sensation carried throughout the general system—the nervous system. And another thing I want to ask you—

DR. INGERSOLL: Do you mean if there is anæsthesia?

DR. JAMES: There may be no material perception of it, but it certainly does exist. Now, with reference to the terminal nerve fibers in the teeth, of which you speak; the fibers entering the pulp cavity of the tooth, the terminating periphery will plug that up. You plugged that, did you not?

DR. INGERSOLL: Yes, sir.

DR. JAMES: I must take issue there because I cannot understand it. Perhaps not taking issue exactly, but as desiring further

explanatory remarks on it. Now,\* let that represent a dotted plane through which there radiates or passes the elongation of some substance which is known as the dentinal fibril, is it not? Now you claim that there are nerve fibers connected with this tubule. I have not been able to demonstrate the presence of nerve in those tubuli.

DR. INGERSOLL: Do not bring up that subject. I never spoke of that. I never spoke on the nature of the nerve fibers. This does not call for that question; it is not involved.

The point which I make is just this: Here is an influence produced upon the nerve fibers which anæsthetizes them. What is it? Why, we know that they lose their conductivity; and if they lose their conductivity, what then? Now here I tie a string around my finger so tight that I find a numbness coming in the end of my finger; there is no feeling in it at all. They are paralyzed, then, are they not? They do not report the sensation to the brain at all—they are paralyzed where this nerve is extensively impinged upon, the finger is paralyzed—has no feeling—paralyzed. I simply meant to make that statement to show that the action of this drug was to paralyze and prevent its conductivity, whatever that fiber is; whether it is nerve tissue or fiber. I will have something to say on that some day or other.

DR. E. R. MULLET, Clinton: I must relate a little experience that I have had in some would-be local anæsthetic. Two years ago I had one brought to my attention; I used it some, but having very soon an occurrence that was so serious that I was alarmed, I ceased its use for quite a while. But there are always some people that want something to relieve suffering and I used it again. I have had what I would call serious troubles caused by the use of this local anæsthetic. So I abandoned its use entirely. I was in Los Angeles when Steinway, of San Francisco, was there, and he was selling the formula. Some of the dentists there became quite taken with it, and one man in particular got the recipe and was injecting it in the gums of all the patients that came to have teeth extracted, and I do not know but he induced many to come for the purpose of extracting their teeth with this local anæsthetic. I was stopping part of the time in a dentist's office, and I think a few clubbed together and bought the recipe. He asked \$25.00 for it.

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\* Here Dr. James turned to the blackboard and illustrated by diagram.

They were using it and the dentist with whom I was stopping told me to copy it and take it along, and I did so. But it was six months or so before I used it. The first bad case I had, a lady who had had some heart trouble; I extracted two teeth for her. She said it did not hurt much; was very well pleased with the operation, but she pretty nearly failed to get home, but was kind enough and her friends too, perhaps, to attribute it to the trouble she had—to the original or previous trouble with her heart. While I was alarmed, I did not say anything, and thought perhaps the cause was really the heart trouble, and the local anæsthetic only stirred that up. Not long after that I had another case, but the lady herself stated that she came near dying, and she was sure, and her physician endorsed that view of it, that the trouble proceeded entirely from the use of this local anæsthetic. Some time later I used it in extracting a couple of teeth for a young lady, and although she had no serious constitutional trouble, yet the gums became exceedingly sore and were sore for several days, more so I knew than would occur from simply extracting the teeth. I have used it once since and I have done with it, except in some cases I would apply it to the gums externally, but not inject it. These cases I refer to were where I had injected it, which was Steinway's method.

(TO BE CONTINUED.)

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#### POST-GRADUATE DENTAL ASSOCIATION OF THE UNITED STATES.

The annual meeting of the Post-Graduate Dental Association of the United States was held at Chicago, June 25th. The following named were elected officers for the ensuing year: President, Geo. H. Cushing, M. D., D. D. S., Chicago; Vice-President, Dr. Russell H. Cool, Oakland, Cal.; Secretary and Treasurer, Lewis S. Tenney, D. D. S., Chicago. Executive Committee: R. B. Yuller, D. D. S., Chicago; Dr. J. M. Gallehugh, Chenoa, Ill.; Dr. G. W. Milton, Silverton, Colo.

This association is but a year old with good prospects of becoming a large and popular national organization, and has a grand work before it. Its object, aside from that general to most dental societies, is to encourage and stimulate post-graduate studies and the establishment of facilities for the same in dental colleges. It also contemplates (when its membership will admit of it) establishing a systematic course of home study with benefits not unlike



the Chautauqua Literary Society; the plan is not yet sufficiently developed.

While the name "Post-Graduate" would imply an association of graduates only, the broad view is adopted of extending the work among all worthy legal practitioners who may desire to join and coöperate; practitioners who are not graduates are not eligible to membership until they have passed a post-graduate or practitioner's course in some reputable and recognized dental college.

Members of the profession who desire to become members of the Post-Graduate Association should correspond with the secretary, Dr. Lewis S. Tenney, 96 State St., Chicago. The membership fee is \$1.00 and the annual dues, payable in advance, \$1.00. Certificates of membership are issued when the members have duly qualified. Membership may be obtained through correspondence when evidence of eligibility is presented.

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#### ESSENTIAL OILS.

Experiments have recently been made with the design of determining the relative antiseptic action of essential oils. The method adopted was to dip the cultures of bacteria, by means of platinum wires, into the oils for a certain time, and then to again imbed them in agar-agar. The micro-organisms then developed if the oils employed were without effect. Typhus bacilli were killed by an immersion for twenty-four hours in the oils of cinnamon, cloves, thyme, verbena, absinthe, sandalwood and cedar. The oils of caraway, juniper, matico, galbanum, melina, valerian, lemon, savin, copaiba, pepper, turpentine, rose, camomile and cummin manifested a similar action in between twenty-four and forty-eight hours; the other essential oils first showed it after two to ten days. For comparison it was found that a 1 per cent sublimate solution destroys the typhus bacillus within ten minutes; iodoform ether requires thirty-six hours. The glanders bacillus is killed by sublimate within fifteen minutes; the oils of cinnamon, cloves, thyme, verbena, geranium and organum effect the same in from twenty-four to forty-eight hours; other ethereal oils in from two to fifteen days. It is suggested that the non-toxic quality of essential oils renders them suitable in the treatment of infectious diseases, but from the economical point of view this may be doubted.—*Journal of the American Medical Association.*

# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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“THE GREAT DENTAL MEETING IN CHICAGO IN 1893.”

“BY WHAT NAME SHALL IT BE KNOWN, AND UNDER WHAT AUSPICES SHALL IT BE HELD?”

*The Dental Cosmos* for July, page 551, *et seq.*, has a long letter from a correspondent who signs himself “Tennessee.” His letter is headed as above. We have read this letter very carefully, and comparing it with events past we are satisfied that it was written by a very astute gentleman, or perhaps two. The familiar way which the author has of imparting the vital truth of how an international medical congress does things, stamps him as one who absorbs information at every pore of his skin. The letter is a general plea for the dentists of the United States to not allow the proposed gathering to be called an International Dental Congress, firstly and secondly to urge the propriety of its being a “memorial” meeting of the American Dental Association—while a little further along he discards this and thinks it might not suit the members of the Southern Dental Association to so name it. Finally, the most distressing thing of all is the fear that some of our transatlantic brethren might have something to do with the management and Americans would be left out in the cold, “Tennessee” included. These are the general ideas contained in the letter, while there are several minor matters, which of course being more numerous, are, strictly speaking, the milk in the cocoanut. One of the unsubstantiable statements is that “It was known that certain parties residing in the United States were very anxious to make the Paris congress a success (*that is true*), and to secure its adjournment to this country, and made several trips to Europe for this purpose. That these

parties were present at the meeting of the American Dental Association at Saratoga in 1889, and that they were anxious to have the Association indorse the Paris Congress, as well as to invite it to adjourn to meet in this country, is also well known." The author of the above statement, who hides himself behind a *nom de plume*, states a falsehood when he says that "certain \* \* \* parties made several trips to Europe" in the interest of the Paris congress.

It is true that a special hour was fixed to take action about indorsing the Paris Congress, or sending delegates to it, or inviting it to adjourn to this country in 1892 or 1893. The motion was made by an avowed enemy of the First International Dental Congress for the sole purpose of defeating any action that might be proposed favoring the Congress to be held in Paris. When the hour arrived the hall was packed by those who were opposed to the Congress, to defeat any attempt that might be made to appoint delegates or in any way express the good will of the association. Those friends of the Paris Congress who were present at Saratoga, made no move at the appointed hour because they valued too dearly the names of those public-spirited dentists of France who were managers of the Congress to have them insulted by the illiberal, selfish, political brood, who would ruin everything that is fair to gaze upon to give themselves added notoriety. Some of these same self-sacrificing patriots spent nearly the whole week of their stay at Saratoga in order to defeat the election of one man to the presidency of the association so that he could not go to Paris with an added laurel of official glory. It was only by bringing in late-comers and paying dues at the last moment that this was accomplished, not because they loved Foster more, but anything to bring defeat to one who knows no master and who does not come or go at the crack of the whip. They have found, since that time, that the president elect is of better stuff than they dreamed of, and he would not consent to an attempted destruction of the next meeting of the A. D. A. by changing the date and place of meeting. All honor to him for his firmness in this matter and devotion to the interest of the dentists of the United States.

The sneer about the mayor of Chicago and the president of the Auditorium Company, etc., is in keeping with the whole letter—anonymous.

The Paris congress did not vote to hold another congress in the United States or elsewhere. It voted that it was in favor of per-



petuating dental congresses, and under circumstances similar to those that gave birth to the first congress, it would favor the holding of a second congress. The question of holding another congress (after the reading of the invitation from four dental societies in Chicago, the letter from the Mayor and the letter from the president of the Auditorium company), was referred to the executive committee to decide, if similar circumstances should arise they would issue a call and the country that held the World's Fair would be chosen as the one which would be urged to hold the second dental congress. A very strong plea is made that the American and Southern Dental Associations should arrange for the dental congress in 1893. Before Tennessee wrote his letter, several dental journals had advocated this, notably, *THE DENTAL REVIEW* and *The Dental Cosmos*.

The wish expressed that there should be no politics in the management is like the "pot calling the kettle black." If Tennessee is not a politician, then we are off the track. "The exposition is to be independent of any exposition ever before held." Why not? All expositions are managed by the citizens of the countries in which they are held. All medical congresses and dental congresses are managed by citizens of the countries in which they are held.

We are in favor of the meeting being called a Dental Congress. If we invite dentists of other countries to meet with us, it will be International. The trend of dental thought and dental education, is to have the degree D. D. S. or D. M. D., cover dental knowledge and dental practice. Dental congresses will prove more useful to dentists, be more helpful, and give greater general results for the good of mankind than a section in medical congresses. In a dental congress all dentists meet on a common footing; in a medical congress they do not. If "Tennessee" wishes the use of our columns to further plead and make misstatements over his proper cognomen, he can have all the space he desires in our August number, "without money and without price." And we promise in advance to bear "malice toward none, and charity" even for "Tennessee."

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#### THE SYSTEMATIC READING OF GOOD BOOKS.

In the light of progressive civilization the necessity for a liberal reading of good books becomes more pronounced every day. Even to those who deny the necessity—and there seems to be some of

these among us yet—the argument must prevail that it is at least an advantage. The man who to-day neglects to follow the literature of his age cannot long keep in heart-beat with the advancement of the world. Nor should we limit our reading to the literature of the present time.

By-gone ages have left us many a rare gem which must not be buried. The classics have been an inspiration to millions; the poetry of the past rang out as sweetly as any of modern times; while many branches of science are ages older than we give them credit for.

There was a time—not so very long ago—when an individual might hope to be tolerably conversant with all the literature of the world, but it has accumulated upon us so fast of late that now it is useless endeavor attempting to read the half of what is written. Discrimination as to what shall be read and what passed by was never so necessary as now. He who reads all that comes in his way, regardless of quality or quantity, not only will waste much of his time, but will confuse his understanding.

Catalogues are numerous enough so that the reader may select precisely the books required for a given course of reading on any topic in hand, and nothing but a systematic following of the subject will repay the time spent. The great diversity of our literature encourages the unwary to drift hither and thither without defined ideas of the true object of reading. System is required here as in every pursuit of life.

Indiscriminate reading tends to disjointed methods of thought, and this—especially to the scientific man—is fatal to concentration of ideas.

Speaking of science brings us naturally to consider the literature of the professions. What is true of general literature, is also true to a certain degree of professional literature. Dentistry is accumulating year by year a list of books which must make or mar her reputation as a profession, and we must look largely to these books and to our current literature to keep alive the spirit of investigation and progress among us.

But even here we must discriminate in our reading. Much that is published on dental topics to-day requires little more than a summary glance, and this fact should be recognized more particularly, and the idea lived up to more rigidly on account of the other fact that some of the things published require our very closest

attention and continued study. To simply read some of the scientific articles written by dentists in the last decade, and remain content with that one reading is a reflection on the intelligence of the reader, and an insult to the writer. These articles should be studied often and carefully. Men have put the best thought and energies of a life-time into some of them, and they should not be lightly passed by.

The advantages of systematic reading in dentistry are as apparent as in any other line of thought, and when we consider how fully the time of the average practitioner is taken with other duties it would seem necessary—if he is to get the greatest amount of benefit from his reading—that he look carefully to the matter and learn when to read, what to read and how to read it.

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#### AMERICAN DENTAL ASSOCIATION.

The American Dental Association seldom meets in the West. The few meetings in its history which may be considered Western were successful, and were largely attended. The meeting to be held at Excelsior Springs next month, ought to be one of the best attended and most prosperous held in many years. The young men who have so largely settled in the Western States within the last few years, should embrace this opportunity to become members of this great national body. Excelsior Springs is beautifully located in the Valley of the Missouri, within a short distance of Kansas City. The hotels are abundant, and their accommodations of the best. The place where the meetings are held is cool, comfortable and spacious—in fact so far as location, hotels, accommodations, etc., are concerned—there remains nothing to be desired.

We hope that the dentists of the West and South who have been desiring that the American Dental Association should oftener come among them, will avail themselves of this opportunity and turn out in full force to give our eastern confrères a royal welcome. Arrangements with railroads throughout the country have been completed, whereby all dentists are enabled to reach Excelsior Springs at a low rate.\*

The officers of sections should not fail to prepare their reports before they reach Excelsior; no section ought to permit its name to be called and passed down to the end of the list, but see to it

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\* See page 497 of this number of DENTAL REVIEW.



that their officers are ready with the report and papers at the time when the section is called. Those who attend should make their arrangements to be on hand when the meeting opens, and to remain until the close. The meeting ought to be made as good as any the Association has ever held and thus encourage it, by the practical interest shown, to come West oftener.

In all probability some arrangements will be made for holding a large meeting of dentists in 1893, and every one who is interested in the general advancement of the profession should not fail to be present.

Engage your room at once if you have not already done so, and be at Excelsior Springs on the morning of the 5th day of next August.

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DR. BLACK.

We learn with pleasure that Dr. Black will resume teaching. He has become connected with the Dental Department of the University of Iowa, and will be a great acquisition to the teaching faculty of that institution. Iowa is a progressive State, and the dean of the dental department is one of the most wide awake dentists in the Hawkeye State. He deserves success, and we wish the school continued prosperity.

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DOMESTIC CORRESPONDENCE.

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*To the Editor of the Dental Review:—*

DEAR SIR—I pat you on the back for your editorial in June issue on “A Code of Ethics for Dental Colleges.” Such institutions should be the fountain-heads of such teaching. Alas! I think from many the stream, if stream at all, is weak.

Your rasp was a sharp one when it made the cut of “money getting.” That is a sore which, when punctured, gushes forth the most purulent matter. It may be easier to criticise than to advise, but doubtless you have broad reasons for your puncture. Has the matter accumulated until safety demands its outlet and the injection of a caustic? Ethics is a word akin to religion. In the latter we look for all that is pure, noble, holy. In the former we expect to find the embodiment of the latter. It all rests upon “do unto others as you would they should do unto you.” Would you have

one to take your money without giving back its equivalent? Would you have one to teach you that which degrades? Can it be possible that we have colleges which would rather hear the jingle of silver in its coffers than to see cultured, ethical men leave its walls.

Mr. Editor, urge the College Association to look sharp after its members. Have you ever read an advertisement somewhat like this? I have. We will give it for the information of the College Association.

### TEETH FILLED AT COST!

PLATES AT LOW PRICES!

Come to the \* \* \* College Infirmary.

\* \* \* \* D. D. S.,

Demonstrator.

Can the young men be blamed who follow such? Give us a code of ethics for the colleges and may the colleges teach ethics.

Yours truly,

B. H. CATCHING.

### REVIEWS AND ABSTRACTS.

#### THE STUDENTS' MANUAL AND HAND-BOOK FOR THE LABORATORY.

Second edition by L. P. Haskell, Professor of Prosthetic Dentistry, Dental Department of the Northwestern University, Chicago. Wilmington Dental Mfg. Co. Philadelphia, 1890. Cloth, \$1.50.

The appearance of the second edition of this instructive little book is as significant of the author's popularity as a teacher, as is the great improvement it shows over the first issue, evidence of his progressive mind over habits of practice.

The new book presents a handsome appearance in its larger size, increased text and added illustrations. Its typographical work is not faultless, however, nor is the letter press all that could be desired.

The subject matter remains much as in the first edition. It is arranged in short chapters, the rules, directions, hints, suggestions and precautions all concisely stated in the positive style so characteristic of the author—a quality in a teacher always greatly appreciated by the student. It must be said, however, that there is much

that can be done still to make Dr. Haskell's book more useful for the special purpose of a text-book for beginners. It all the way through shows a lack of systematic arrangement of ideas. For instance, Chapter I. on "General Principles" is rich with valuable advice, but it loses much force by reason of its lack of proper formulation—under appropriate headings with perhaps more careful explanation. The general value of the teaching is occasionally impaired by dogmatic assertion as unreasonable as it is badly expressed—*vide* page 13: "Never take an impression in wax, and then plaster in it." This method of taking an impression has been followed for twenty years past by the most precise and successful prostheticians. There is little to criticise and much to praise in the admirable rules and directions in every chapter. Honest criticism is what a writer asks, and he especially wishes his attention directed to faults. This is not a serious one. In Chapter ix., the method recommended for attaching a clasp to a plate with wax, can be greatly improved upon by placing the separate clasp and plate in the mouth and joining the two with plaster. This will give accurate relation of the parts. In Chapter xi., this paragraph is inexcusably faulty. "To make *clasp gold*, take twenty-karat plate and add two penny-weights platinum." The first paragraph of Chapter vi., is badly written, and furnishes a fair sample of the style we are so often obliged to condone in the literary products of dentists, and which eloquently pleads for higher educational culture in those who would enter our ranks now and forevermore. Perhaps the part of a book of greatest value is that chapter which treats of the selection and arrangement of teeth. It is crowded with good thoughts the result of a long experience and a clear insight into the requirements of artificial dentures.

A description of Dr. Angle's most useful system of correcting irregularities of the natural teeth is appended to the book and would seem to be irrelevant to the subject in hand. This inconsistency is particularly noticeable, as the author takes the ground in the preface that crown and bridge-work is too broad a subject to be treated in his book. Surely, orthodontia is as broad and as deserving of special treatment in a separate work. Nevertheless, Dr. Angle's system merits all the publicity it can get through whatever medium, and we are glad to have this opportunity to study it. Dr. Haskell's book is worthy of a place in every dental library.



## DENTAL COLLEGE COMMENCEMENTS.

## UNIVERSITY OF MICHIGAN—DENTAL DEPARTMENT.

The Forty-Sixth Annual Commencement Exercises of the Dental Department of Michigan University were held on Thursday, June 26, 1890. The commencement oration was delivered by Andrew D. White, LL. D. The degree of Doctor of Dental Surgery was conferred on the following named (37) persons:

William R. Calhoun.  
Leo David Camp.  
Ernest Catt.  
Charles Eli Collamer.  
Charles Floyd Cook.  
George Howe Copp.  
Norman Kershaw Cox.  
Charles Hugo Farman.  
Fred Dawson Fisher.  
Ida Gray.  
John Jarius Green.  
John Joseph Giusti.  
Bertrand Francois Hall.  
Edgar Allen Honey.  
William George Howley.  
Carolyn Murray McElroy.  
Melville Arthur Mason.  
Chester Cleveland Merriman.  
Eli Louis Moore.

George Northcroft.  
Henry Turner Osborne.  
James Andrew Oswald.  
Albert John Rust.  
Charles B. Scudder.  
Alice Lovyse Sherman.  
William Hall Sieberst.  
Fred Cameron Sizelan.  
Mortimer F. Stever.  
Fritz Bernhart Tegener.  
George T. Thuerer.  
Howard Devon Van Antwerp.  
Gerrit Henry Veldhuis.  
John Hardin Waterhouse.  
Charles Elmer Welch.  
Gordon William Welch.  
Harry Lloyd Williams.  
Paul Woolsey.

## HARVARD UNIVERSITY—DENTAL DEPARTMENT.

On Wednesday, June 25th, the commencement exercises of Harvard University were held as usual in Sander's Hall, at which the dental degree was conferred upon the following named (16) students:

Sidney Roland Bartlett, Boston.  
Harry Oliver Dixon, Milford, N. H.  
Benjamin Howard Codman, Boston.  
Edwin Hartley Dixon, So. Eliot, Me.  
Arthur Warren Eldred, Worcester.  
Charles Manning Keep, Brookline.  
Charles Elmer Luce, Walnut Hill.  
Kotai Masuda, Tokio, Japan.  
Arthur Judson Oldham, Wellesley Hills.

Hermann Paal, Osnabruck, Germany.  
Charles Ernest Perkins, Brockton.  
Oscar Pulvermacher, Berlin, Germany.  
Edward Rolfe, Valparaiso, Chili.  
Elbridge Abbott Shorey, Dover, N. H.  
Frank Turner Taylor, New Bedford.  
Charles Bryant Titcomb, San Francisco, Cal.

## UNIVERSITY OF MINNESOTA—DENTAL DEPARTMENT.

At the commencement exercises of the University of Minnesota, held June 5, 1890, the degree of Doctor of Dental Surgery was conferred upon the following (6) persons:

Clinton Smith Deitz, Lake Preston, S. D.  
Arthur Ellsworth Peck, Minneapolis, Minn.  
Franklin Randolph Wright, Minneapolis, Minn.

William Herbert Dunn, Northfield, Minn.  
Charles Alonzo Van Duzee, St. Paul, Minn.  
Mrs. Edith Hewett White, Minneapolis, Minn.

## BOSTON DENTAL COLLEGE.

The Commencement Exercises of the Boston Dental College were held June 18, 1890, at Berkeley Temple, Boston, Mass. An address was delivered by Rev. A. S. Winship, entitled "The Professional Man at Work and at Play." Prizes were presented by the Dean. Awarding of the degrees by the President of the College, I. J. Wetherbee, D. D. S. Valedictory by Wallace Bardeen, D. D. S. Number of matriculates, eighty. The following is a list of the (28) graduates :

H. G. Adams, Mass.  
 W. H. Arnold, Mass.  
 J. W. Bailey, Mass.  
 W. Bardeen, N. Y.  
 G. F. Beard, Mass.  
 G. W. Bosworth, Mass.  
 A. R. Brown, Mass.  
 W. J. Ceerrie, N. B.  
 E. E. Gleason, Mass.  
 C. W. Hammett, Mass.  
 L. L. Greeley, Mass.  
 P. J. Kelley, Mass.  
 W. N. Kidder, Mass.  
 E. F. Lamson, Mass.

L. E. B. Lamson, Mass.  
 J. H. Martin, Maine.  
 G. H. Newland, Vt.  
 E. J. Palmer, Mass.  
 B. A. Phillips, Mass.  
 Annie F. Reynolds, Mass.  
 R. F. Remals, Mass.  
 F. A. Sawyer, Mass.  
 C. W. Tobin, Mass.  
 C. P. Vesper, Mass.  
 A. Wengenroth, Germany.  
 F. H. Whitehouse, Mass.  
 A. L. Whitney, Maine.  
 S. P. Willard, Mass.

## PRACTICAL NOTES.

## ADVERTISING DENTISTS.

By S. B. BROWN, D. D. S., M. D., FORT WAYNE, IND.

No dentist worthy of the name will by word or deed retard the progress of his profession. Men may honestly differ as to their methods for advancement, but none can advertise beyond his plain professional card, and believe dentistry a profession. The advertising dentist does not regard himself as pursuing anything but a trade, and should be so designated.

Professional dentists treat pathological conditions and preserve the teeth; for this a fixed fee cannot be named and competition for cheapness entered into more than can the fee for the services of a general physician or surgeon. Advertising dentists lay particular stress on cheapness; this is their snare. Low fees limit ambition to do the best possible, degrades and embarrasses the whole profession. Men endowed with intellect, who seek to acquire fame, would turn from dentistry because of the evident lack of pecuniary return, and instinctively shrink from a profession whose representatives, as indicated by the daily press, do not rise above trade and barter methods. The trade dentist aims to defend these methods

on the ground of instructing the public as to his capabilities, professedly ignorant of the fact that the word dentist implies all known of dental practice, that the seeker for dental aid calls for information or treatment the same as a client calls upon the lawyer, and the patient upon the physician or surgeon. In his heart this is not his main object, it is to claim superiority or offer some attraction to credulous readers over some rival practitioner.

What would surprise our people more than to read in the newspapers that Dr. Meyers, surgeon, had purchased the exclusive right to use the hand saw in amputations, a patent staved splint for fractures, thus enabling him to operate at half the usual prices. This is not more absurd than many claims made by the advertising dentists. "Painless dentist," "Cameo sets inserted while you wait," are among the latest attractions.

An advertiser in a Kansas City paper startles conservative dentists by the announcement of "over two hundred teeth extracted daily."

Reputable dentists favor low fees for the deserving, but choose to personally discriminate.

Trade dentists make cheapness the prime consideration. This element in our calling is the worst enemy now menacing us.

Dr. J. E. Fitzgerald of Youngstown, Ohio, has the temerity to defend this class in the May number of the Items of Interest. He speaks of the "Code of Ethics" dentist "sitting in the seventeenth century old arm chair." I would refer him to the roll of membership of the American Dental Association, the New York, Ohio and Illinois States Dental Associations, as well as members of all other regular dental Associations. All of these are his "Code of Ethics dentist." These are the ones he relegates to the seventeenth century. If these dentists belong to that age, surely the trade or advertising dentists he so feebly defends must be co-existent with the cliff-dwellers of prehistoric times.

However in the face of the glaring charlatanry of the advertising dentist we may well take courage. Compulsory dental education, the enlistment of better talent, the unselfish efforts of master minds, together with the growing appreciation of the public, are sure to soon weed from our ranks these straggling guerillas that now encumber our advancement.



## MEMORANDA.

Are you going to Excelsior Springs?

Dr. L. D. Shepard has gone to Europe.

Drs. E. S. Talbot and A. E. Brown have gone to Europe.

Dr. James Truman is to be the editor of the *International Dental Journal*.

The West will be largely represented at Excelsior from all we can learn.

Dr. W. W. Walker, of New York, paid a flying visit to Chicago early in July.

Dr. C. C. Chittenden, of Madison, Wis., has been elected an alderman of that city.

Dr. Clinton Atkinson, eldest son of Dr. W. H. Atkinson, died of pneumonia, May 31st.

The Indiana Dental Association has delegated all the business of the sessions to a council, after the manner of the Illinois and other societies.

Drs. McIntosh (141 Wabash Avenue) and Dr. Smith (103 State Street) will for the present fill all orders for the Ward Electro Metallic Plate.

C. B. Rohland, D. D. S., of Alton, Ill., has been appointed to the State Board of Dental Examiners in Illinois, to succeed the lamented Dr. Judd.

The Wisconsin State Dental Society, Southern Dental Association and New Jersey State Dental Society, all meet to-day, July 15. We hope all will be well attended.

Effie Ramsey Monfort, the wife of Dr. J. B. Monfort, of Fairfield, Iowa, died on June 17, 1890. The REVIEW extends its sympathy to Dr. Monfort in his bereavement.

Dr. G. D. Sitherwood, of Bloomington, has taken unto himself a wife, and passed through this city last month on his way to Europe, where he intends spending his honeymoon.

Dr. J. W. Wassall, of Chicago, was united in marriage to Miss Grace Runnion, on Monday evening, June 30. His associates on the DENTAL REVIEW staff extend to him congratulations.

There are 5,077 medical practitioners registered in London, 13,715 in the rest of England, 2,658 in Scotland, and 2,577 in Ireland. The total mortality last year was only 20.3 per 1,000, while that of men "in all occupations" is 22.83.—*Ex.*

Garretson's Oral Surgery, 5th edition, will be issued by the Lippincotts about August 5th. The work has been entirely rearranged and includes mechanical dentistry. Several hundred new pages have been added and it will be fully abreast of the times. It will be copiously illustrated.

Among those in Chicago during the month of June was Dr. S. J. Hill, of Fargo, N. D. Dr. Hill is president of the North Dakota State Board of Dental Examiners, and of the North Dakota State Dental Society, which meets at Fargo, July 29. Among those who have promised to send papers to that meeting are Drs. Cushing, Harlan and Ottofy. Dr. Case, of Jackson, Mich., will send models for exhibition.

At the post-graduate course of the Chicago College of Dental Surgery, the profession was represented by practitioners from the St. Lawrence to the Golden Horn, and from Georgia, which has the distinction of being the first State having a dental law, to North Dakota, which enjoyed an equal distinction while yet a Territory.

The Dental Protective Association is rapidly increasing in membership. Several dentists have recently applied for membership immediately after suit had been instituted against them by the International Tooth Crown Company, but their applications had to be rejected. "Don't put off the day of salvation. Come in now—now is the time to be saved."

An addition has been made to the facts in the controversy regarding the use of chloroform in the shape of statistics showing that the accidents due to the employment of chloroform in Paris hospitals during the last ten years have been in the proportion of 1 to 1,236, while the accidents due to the use of ether have been only 1 in 12,581 cases.—*Exchange*.

The market price of platina has so risen, that artificial teeth are sold at a considerable advance over former prices. It is said much of the rise is due to the increased amount of use found for platina, especially in China and Japan. A firm in the latter country, which has, until recently used but small quantities of the metal, sent an order to this country for a million dollars' worth of the metal.

Our esteemed friend, Dr. John C. Story, of Texas, is in doubt about potash-alum. "He wants to know, you know," where it is described. If he will turn to Watts' Dictionary of Chemistry or Bloxam's Chemistry, under the head of alum, he will find out all that is known up to date. Look also at the U. S. or National Dispensatory and you will be further enlightened. If this is not satisfactory, write to We, Us & Co. Selah!

The South Dakota Dental Society held their seventh annual meeting June 3, 4 and 5th, in the city of Yankton, which was the most successful and profitable meeting ever held by this young and vigorous society. Next meeting will be held at Aberdeen, at which time we expect to have some of the experts from the Twin Cities, Minneapolis and St. Paul. Officers for ensuing year: President, Dr. W. H. Barker, St. Lawrence; Vice-President, Miss L. A. Dix, Yankton; Secretary, Dr. O. M. Huestis, Aberdeen; Treasurer, Dr. C. G. Maxon, Vermillion.

O. M. H.

The post-graduate course at the Chicago College of Dental Surgery, during the month of June was attended by forty-five practitioners from all parts of the United States and Canada. It proved to be successful, as was demonstrated at the banquet given at the Leland Hotel on June 26. Short speeches were made by nearly all those in attendance; and the general expression of those in attendance seemed to indicate that much good had been done, that those who attended the course had gained something, and that their patients will get the benefit of the time and money spent by these progressive dentists. Almost to a man these dentists will be in Chicago to attend the Second International Dental Congress in 1893. The advantages of the Dental Protective Association were fully set forth by Dr. Crouse.

## NOTICE.

The National Association of Dental Faculties will meet on Monday, August 4, at 10 a. m., at Excelsior Springs, Mo.

JOHN S. MARSHALL,  
Secretary.

## A WOMAN DENTIST IN BOSTON.

Annie Felton Reynolds, the first woman dentist to graduate in Massachusetts, received her degree of D. D. S. from the Boston Dental College June 19, 1890. She also received first prize for senior honors.

## INDIANA STATE DENTAL ASSOCIATION.

President, C. A. Budd; vice-president, S. B. Brown; secretary, R. W. Van Valzah; treasurer, Merritt Wells; executive committee, W. N. Wilson, J. E. Waugh, T. S. Hacker. Indianapolis next place of meeting.

## A NATURAL MISTAKE.

"Do you give gas?" groaned the man with the swollen jaw, rushing blindly into the room and climbing up in the cushioned chair.

"We do, sir, to some extent, replied the dignified man standing by the chair, but we don't pull teeth. This is a barber shop, sir."

## COFFEE AND MICROBES.

According to the *Lancet* Dr. Luderitz has recently made a number of observations on the destructive power of coffee upon various microbes. He found that the organisms all died in a longer or shorter period. In one series of experiments anthrax bacilli were destroyed in three hours; anthrax spores in four weeks; cholera bacilli in four hours, and the streptococcus of erysipelas in one day. Good and bad coffee produce precisely similar effects.

## HAD HIS FOOT BLOWN OFF.

ST. PAUL, Minn., July 5.—Shortly before 2 o'clock yesterday morning Dr. Corcoran, dentist, had his right foot blown off by fireworks. Dr. Corcoran and several other young men had been amusing themselves all night long in front of the old drug store of W. S. Getty, exploding upon the curbing a preparation made of sulphur, potash and some other ingredients. The mixture was spread upon the curbing, a good sized stone placed over it and then a match was applied to it, with the result mentioned above.—*Exchange*.

## NORTH DAKOTA STATE DENTAL SOCIETY.

The Eighth Annual Meeting of the North Dakota State Dental Society will be held in Fargo, July 23-24, 1890. Papers are expected from Drs. Cushing, Harlan and Ottofy, of Chicago; A. O. Hunt, of Iowa City, and Chas. B. Atkinson, of New York City. Dr. E. H. Angle, of Minneapolis, will be present to lecture and give clinics on Orthodontia, and Dr. N. D. Edmonds, of Chicago, will give a lecture on Crowns and Bridges, illustrated by models. J. W. CLOES, Sec'y.

The North Dakota State Board of Dental Examiners will meet in Fargo, on Tuesday, July 22, 1890, at 9 a. m.

J. W. CLOES, Sec'y.

## KENTUCKY STATE DENTAL ASSOCIATION.

The following is the list of officers for 1890-1: W. E. Baxter, Frankfort, president; W. M. Steen, Augusta, vice-president; A. F. Canine, Louisville, Treasurer; J. H. Baldwin, Louisville, secretary; executive committee: W. P.



McQuown, Georgetown; J. B. Alexander, Louisville; H. B. Tileston, Louisville. Board of Censors: L. A. King, Henderson; C. G. Edwards, Louisville; W. C. Nesbitt, Owingsville. State Board of Examiners: F. Peabody, Louisville; A. O. Rawls, Lexington; W. Van Antwerp, Mt. Sterling.

#### DENTAL PROTECTIVE ASSOCIATION.

The following resolutions were adopted at the late meeting of the Michigan State Dental Association:

*Resolved*, That the Michigan Dental Association heartily approves the aim and plan of the Dental Protective Association, and that it is further

*Resolved*, That it is the duty of every member of the dental profession in this State to join the Dental Protective Association.

*It is also Resolved*, That Dr. Crouse be requested to furnish the dental journals with an abstract of his remarks for publication.

W. H. DORRANCE,

W. G. SAUNDERS,

I. DOUGLAS, *Committee*.

#### MEETING OF THE AMERICAN DENTAL ASSOCIATION.

The railroad arrangements are not all completed, but enough is known to assure at least the usual reduction of one and a third fare, on certificate plan, by all the different passenger associations.

Arrangements are being made for a special train from Chicago, which will leave here Sunday afternoon and reach Excelsior Springs Monday morning. This will give the entire day Monday for the different sections to complete their reports.

All parties wishing to go on this special train will confer a favor by letting us know at once, so that we may know how many to arrange for. Just what rate will be secured for the round trip is not definitely settled, but we expect a low one.

A notice will be issued later giving exact time of starting and route selected.

Application has been made for reduced rates for the four associations—the American Dental Association, College Faculty Association, the Association of Dental Examiners and the Dental Protective Association. We are trying to get this rate good for ten days, so that we need not adjourn before everything is finished. Parties purchasing tickets should be sure to get receipt, showing that they have paid full fare going. This will enable them to get return tickets for one-third regular fare.

J. N. CROUSE, *Chairman Ex. Com.*,

2231 Prairie ave., Chicago.

#### HYPNOTISM IN DENTISTRY.

An interesting trial of hypnotism as an anæsthetic is reported from England. It was carried on in the presence of upward of sixty medical men and dentists. The hypnotic influence was induced by Dr. Milne Bramwell, an authority on the subject. The first case was that of a woman of twenty-five, who was hypnotized at a word, and who had three teeth extracted without pain either during the operation or afterward. The second case was that of a servant-girl, nineteen years old, whom Dr. Bramwell had treated for a large lachrymal abscess. She was put to sleep by the following letter, sent with her by Dr. Bramwell to Mr. Turner, the operating dentist: "Go to sleep by order of Dr. Bramwell and obey Mr. Turner's commands." Her sleep was so profound that at the end of a long operation, in

which sixteen stumps were removed, she awoke smiling and insisted that she had felt no pain. It was also remarkable that there was no pain in her mouth when she was conscious. Other operations performed on patients under the hypnotic influence, were the removal of the great toe of a boy eight years old, the removal of an enlarged tonsil from a girl of fifteen, the removal of a cyst from the nose of a young woman, and two dental operations on men. Dr. Bramwell explained the patient's required training in this form of anæsthesia, the time required for preparation varying with individuals. One of the patients shown had been completely cured of drunkenness by hypnotic suggestion, and another had obtained refreshing sleep at night while suffering from a severe attack of neuralgia, the sleep being induced by his daughter through a note and on one occasion through a telegram from Dr. Bramwell.—*Medical News*.

## FILLING TEETH.

No, friend, I have not lost my mother,  
 She was never so well in her life;  
 I'm not mourning a death of a brother,  
 Nor the sickness nor flight of a wife.  
 'Tis not love and the sneers of a woman  
 That have turned my face ashen and gray;  
 'Tis the prospect of torture inhuman—  
 I've a "date" with the dentist to-day!

'Not a comrade of mine has turned traitor,  
 I think they are all true as steel;  
 Nor has any Calumny's rife incubator  
 Hatched ought that will injure my weal.  
 My liver is right, and my stomach  
 Is a mortar all viands to bray;  
 Yet I feel in my bosom a dumb ache—  
 I've a "date" with my dentist to-day!

I have not sunk the bulk of my riches  
 In a foolish, unfortunate spec;  
 My conscience shows no surgeon's stitches,  
 No ghosts rise at Memory's beck.  
 There is not at the root of my sadness  
 Some mystery hidden away;  
 This only torments me to madness—  
 I've a "date" with my dentist to-day!

Oh, I think and I dream till I shiver  
 Of engines, of burs and of drills;  
 My nerves are awake and they quiver,  
 And my soul with expectancy thrills.  
 In my teeth I shall soon have him feeling  
 With his prod in a business-like way,  
 Caring naught for my squirming and squeeling—  
 I've a "date" with the dentist to-day!

—[George Horton.

## MICHIGAN STATE DENTAL ASSOCIATION.

At the meeting of the Michigan Dental Association, the principal points in Dr. Crouse's remarks were: First, that by combining in some such an organization as the Dental Protective Association, we band the strength of 10,000 men into one, and all defense necessary can be made with but little more expense than would be required for an individual. The preparation of one case will answer for all, and all evidence can be collected better by an association than in any other way.

Second, that it is very important that all get into the association at this time, for the reason that an appealed suit to supreme court before formation of the Protective Association will probably be decided in favor of the Crown Company, owing to deficiency of evidence and imperfect presentation. If the Crown Company win this suit they will send notices all over the United States, thereby demoralizing the profession and cause many to pay them money who should be in the Protective Association and avoid that calamity.

The Protective Association will be ready with new evidence and a new record, and can take care of its members against any claims of the crown company. If you are not in the association, the association will not take care of you when the time comes. If each man in the profession will pay ten dollars and assume a responsibility of ten more, without further assessments, we will have an organization that is sure to break up all this abuse and save the dental profession an annual outlay of on an average one hundred dollars each to unjust claimants. Remember, it will cost more than ten dollars later to join, and will certainly cost more than that if you do not protect yourself.

WM. CLELAND, Secretary.

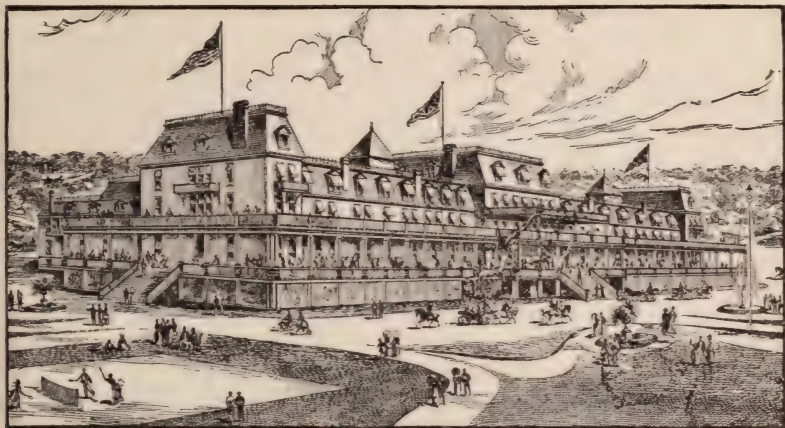
## EXCELSIOR SPRINGS.

The place of meeting of the American Dental Association seems to have been well chosen; from the accompanying cuts, a view may be had of some of the aids

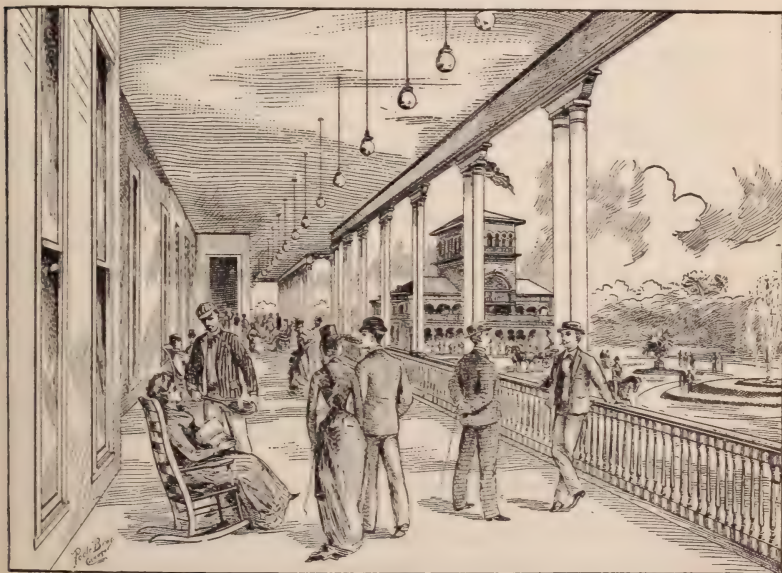




to comfort while there. If you desire to secure accommodations, it will be well to write to the "Elms," the leading hotel, in advance, as Excelsior is a popular place.



We look for the largest turnout of Western dentists since Minneapolis. There will be counter attractions, it is true, but there are enough dentists to go



'round, and make all the meetings pleasant and successful. Be sure to go early and stay late, as it is desired to make this a memorable meeting.

## AND STILL THEY COME !

Continental College of Dental Surgery, Chicago; for general education in dental and oral surgery; capital stock, \$5,000; incorporators, J. A. Whipple, C. E. Ward and F. L. Whipple.

## HE CLAIMED HER TEETH.

A well-known dentist tried hard to collect a bill, but, after many ineffectual efforts, said to the debtor: "I do not intend to send you any more bills, and I don't intend to sue you, but there is one thing I want to tell you. Every time you cut off a piece of beefsteak and pass it to your wife I want you to remember that she is not chewing that beef with her teeth, nor with your teeth, but with my teeth." In two or three days he received a check. The motion of those double-false teeth in his wife's mouth was too much for him.—*Christian Advocate*.

## SOUVENIR.

The Pabst Brewing Company of Milwaukee issued a souvenir for the Knights of Pythias conclave recently held in Milwaukee. This consisted of the old but ever new story of Damon and Pythias, by A. Cressy Morrison. The souvenir was embellished with a photograph of the "Interior of Dionysus' Amphitheatre, 384 B. C.," Gateway to the Same, The Old Greek Prison, Dionysus' Judgment Seat, Window in the Castle, Tomb and Altar. Pythians who were not present by sending to the Pabst Company we presume would have one of these imperishable souvenirs, which may be treasured as a keepsake memorial of the monster conclave.

ST. LOUIS, MO., June 10, 1890.

At a meeting of the St. Louis Dental Society, held on Tuesday, May 20, 1890, the following resolutions on the death of Dr. Homer Judd were offered and adopted:

*Whereas*, The members of the St. Louis Dental Society have learned, with great sorrow, that death has removed from us our loved and honored associate, Dr. Homer Judd; and,

*Whereas*, By reason of his great natural abilities, ripe scholarship, zeal, industry and integrity, he was recognized by the dental profession as one of its most influential members; a man who devoted his life to the honor and advancement of his profession; and,

*Whereas*, During a long professional life, his relations with this Society have been such that it is our pleasure and duty to record our high appreciation of him; therefore

*Resolved*, That by the death of Dr. Homer Judd, the dental profession has been deprived of one of its most able and useful members—one whose influence for good will live forever.

*Resolved*, That we extend to his family our sincere sympathy in their great bereavement.

*Resolved*, That a copy of these resolutions be sent to the family of the deceased and to the dental journals for publication.

W. H. EAMES,	} Committee.
HENRY FISHER,	
A. J. PROSSER.	

MRS. EMMA E. CHASE, Cor. Sec'y.

TENTH INTERNATIONAL MEDICAL CONGRESS. BERLIN, 1890.—INVITATION TO TAKE PART IN THE PROCEEDINGS OF THE SECTION FOR DISEASES OF THE TEETH.

In accordance with the resolution of the Ninth Congress held at Washington, the Tenth International Medical Congress will be held this year at Berlin, opening on the 4th of August, and continuing till the 9th of August, 1890. The delegates of the medical faculties and chief medical societies of the German Empire have elected us, the undersigned, as members of a Sectional Committee of Organization. In this capacity we have the honor cordially to invite your participation in the proceedings of our section. We hope to enjoy the satisfaction of welcoming large numbers of our colleagues to Berlin and also of seeing our section meetings numerously attended. We append the programme of our Section, as far as hitherto fixed, with the request that any further proposals, as well as offers or addresses, papers or demonstrations, may be sent in with as little delay as possible. With the hope that the meetings of the Section may prove interesting in themselves and useful to the advancement of science, we remain most respectfully,

THE COMMITTEE OF ORGANIZATION FOR THE SECTION : DISEASES  
OF THE TEETH.

Busch, Berlin ; Calais, Hamburg ; Hesse, Leipzig ; Fricke, Kiel ; Hollander, Halle ; Miller, Berlin ; Partsch, Breslau ; Sauer, Berlin ; Weil, Munchen.

Also communications or inquiries regarding the business of the Section must be addressed to Professor Busch, Berlin NW., Alexander-Ufer 6. Other communications and inquiries of a general character must be directed to the general secretary of the Congress, Dr. Lassar, Berlin NW., Karlstr. 19.

*Preliminary Programme of the Dental Section.*

Monday, the 4th of August, 1890, after the close of the first general session, constitution of the Dental Section by the election of officers.

From Tuesday 5th until Saturday 9th inclusive, practical demonstrations will be given each day in the forenoon, between 9 and 12 o'clock, in the Dental Institute of the Royal University, Dorotheenstrasse 40.

These demonstrations will consist in extraction and narcosis, in filling and in artificial work. Gentlemen desiring to demonstrate, either in extraction and narcosis or in artificial work, are requested to apply to Professor Busch, (Alexander-Ufer 6). Those who wish to demonstrate in filling are requested to apply to Professor Miller (Vossstrasse 32). For these demonstrations there are in the dental institute 15 chairs with good light, which number, in case of urgent necessity, might be increased to 19. The afternoons, between 2 and 5 o'clock, will be devoted to theoretical lectures and discussions, in the hall of the Ressource zur Unterhaltung, Oranienburgerstr. 18.

The following five themes have been selected, the discussion of which will be opened by members appointed for the purpose :

1. Narcosis with bromide of ethyl in dental operations.
2. The cause, course and treatment of Pyorrhœa alveolaris.
3. The participation of micro-organisms in decay of the teeth.
4. Crown and bridge work.
5. Irregularities of teeth.

The members are also at liberty to present communications upon subjects with which they have particularly occupied themselves. Such communications, along with a short resume of their contents, should be announced to the



chairman of the committee (Professor Busch, Alexander-Ufer 6). On those days on which general sessions are held (between 11-2 o'clock), the practical demonstrations will be closed earlier and the theoretical lectures begun later.

*Extract from the general Regulations and Programme.*

IX. In the meetings of the sections, questions and problems will be discussed, which have been agreed upon by the special Committees of Organisation. The communications of those appointed by the committee to report on a subject, shall form the basis of discussion. As far as time allows, other communications or proposals, proceeding from members and sanctioned by the Committee of Organisation may also be introduced for discussion. The Bureau of each section decides as to the acceptance of such offered communications, and as to the order in which they shall come before the meeting, always provided that this point has not been already determined in the meeting itself by a decree of the section.

Scientific questions shall not be put to the vote.

X. Introductory addresses in the Sections must as a rule not exceed twenty minutes. In the discussions no more than ten minutes are allowed to each speaker.

XI. All addresses and papers in the general and sectional meetings must be handed over to the Secretaries, in writing, before the end of the meeting. The Editorial Committee shall decide whether—and to what extent—these written contributions shall be included in the printed Transactions of the Congress. The Members who have taken part in the discussions, will be requested to hand over to the Secretaries, before the end of the day, in writing, the substance of their remarks.

XII. The official languages of all the meetings shall be German, English and French. The Regulations, the Programme and the Agenda for the day will be printed in all three languages.

It will, however, be allowable to make use of other languages than the above for brief remarks; always provided that one of the Members present is prepared to translate the gist of such remarks into one of the official languages.

Those who take part in the Congress shall pay a subscription of twenty Marks (one Pound sterling or five dollars) on being enrolled as Members. For this sum they shall receive a copy of the Transactions, as soon as they appear. The enrollment shall take place at the beginning of the Congress. Gentlemen may, however, be enrolled as members by sending the amount of the subscription to the Treasurer\* with their name, professional status and residence appended.

There will be as stated in the circular, five general themes for discussion and then with the clinics and demonstrations by men selected by the General Committees, will form the official programme. Of these five general themes, one has been apportioned to Germany; one to England; one to France and two to America. The subjects assigned to this country are Crown and Bridge Work, to be presented by W. C. Barrett, Buffalo, N. Y. And Irregularities of Teeth to be presented by E. S. Talbot of Chicago.

The other papers read will be selected from the voluntary contributions and as many will be given a place, as time will admit of, and the General Committee shall select.

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\* Treasurer's address: Dr. M. BARTELS, Berlin SW., Leipzigerstr. 75.—Please enclose a visiting-card.

# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, AUGUST 15, 1890.

No. 8.

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## ORIGINAL COMMUNICATIONS.

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### **PATHOLOGICAL CONDITIONS OF THE ETHMOID BONE RESULTING FROM DENTAL LESION.\***

BY I. P. WILSON, D. D. S., BURLINGTON, IOWA.

In considering the subject of this paper it seems necessary first, to examine, to some extent, the peculiar location of this marvelous structure of bone—its anatomical formation, and the relations it sustains to the surrounding tissues.

It is held in position by more than a dozen bones of the face and cranium, which so hedge it in on all sides that it cannot be examined minutely except when disarticulated.

When isolated from its associates we find its measurements to be about  $1\frac{3}{4}$  inches in length,  $1\frac{1}{2}$  inches in depth, and  $1\frac{1}{4}$  inches in thickness, making it of a somewhat cubical form. The constituent parts of this bone consist of a horizontal and a perpendicular plate, and to the lateral borders of the former are attached two spongy masses of bone composed entirely of cells, some of which communicate with each other, while all open either directly or indirectly into the nasal fossæ.

The horizontal or cribriform plate as it is called, occupies the space, or fills the "notch" between the orbital plates of the frontal bone, thereby forming a part of the walls of the cranial cavity.

Rising from the median line of the superior surface of this plate is a firm, triangular-shaped crest of bone resembling in shape a cock's comb, hence its name, "crista galli."

From the inferior surface and continuous with the "crista galli," descends the perpendicular plate which forms a part of the septum of the nose.

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\* Read before the Iowa State Dental Society.

The "lateral masses" of the ethmoid as stated above, are attached to the outer margins of the horizontal plate, and drop down for an inch and a half on either side of the septum of the nose. These two "masses" contain more than a score of air-cells surrounded by bony walls no thicker than the paper upon which I am writing.

The ethmoid when separated from the frontal bone is found to contain several open cells in front, the remaining portions of which are found in the orbital plates of the frontal, and open directly into the frontal sinuses.

Behind are also found open cells which communicate directly with two large cavities in the body of the sphenoid bone.

But the greatest air-cavity of all is the Antrum of Highmore, and this is also found to be associated with the ethmoid bone.

From the anterior part of each lateral mass the unciform process reaches down to the orifice of the antrum, and assists in narrowing this outlet. It is also connected with the inferior turbinated, and with the thin walls of the antrum.

The middle and superior turbinated are processes of, and belong to the ethmoid, and as the name indicates, each is rolled upon itself. They are attached to the inner surface of each lateral mass—pass outward, downward and inward forming a curved plate of thin bone measuring almost two inches in length, and about one inch in width.

If we make a complete exploration of the nasal fossæ we find the ethmoid bone occupying a large portion of the cavernous passage.

It forms a part of the walls of the cranial cavity, of the orbit and of the nares. The air we breathe should, and usually does, pass between its convoluted walls.

All the air cavities and passages are, of course, lined on both sides with one continuous layer of mucous membrane which is highly vascular, and almost trebles the thickness of those paper-like walls and plates.

When this mucous membrane is in a normal condition with warm blood rushing through its vascular walls, it acts as a radiator, in warming, and as a filter in purifying the air in its passage to the lungs.

This remarkably fragile frame-work of bone contains the organ of smell.



The cribriform plate (so called from its sieve-like appearance) supports the olfactory lobes of the brain. From the under part of these lobes or bulbs are given off a score or more of nerve filaments which pass through the foramina in the cribriform plate, and are distributed in the mucous membrane of the septum, the roof of the nose, the superior and middle turbinated, and then extend forward upon the spongy walls, so that a complete network of olfactory filaments ramify the mucous membrane that encloses the fragile structure of the ethmoid.

Having thus briefly refreshed our memories regarding the anatomical structure—the office, and the environments of this cellular texture of bone, we are prepared to consider the dangers to which it is exposed from dental lesion.

Garretson says that “maxillary diseases find an easy road to the base of the cranium through the nasal communication with the ethmoidal cells.”

That the maxillary diseases referred to usually arise from diseased teeth will scarcely be questioned. This one short sentence is all I have been able to find in several medical and dental works I have examined, having the least reference to the pathological conditions of the ethmoid, as resulting from diseased teeth. I shall, therefore, be obliged to consider the subject of this paper entirely from the stand-point of personal observation of cases in practice, two or three of which I will now relate.

During mid-summer of last year I was constructing a partial upper set of teeth for Mrs. B., 50 years of age, who had always enjoyed excellent health until a few years before, when she suffered from a severe attack of congestion of the liver resulting in an abscess of that organ, which has ever since discharged periodically, through her lungs.

While fitting the plate to her mouth I discovered a slight discoloration of the second upper molar on the right side. The tooth had been filled, and seemed to be in a perfect state of preservation. On percussion, however, I found it slightly sensitive, but there were no external indications of an abscess.

The tooth had been filled many years before, and she believed had never given her any trouble. The filling was small, so I concluded that the pulp had not been destroyed by the operator, but had subsequently perished from some other cause. I then inquired of the lady if she was troubled with nasal catarrh, to which she re-

plied, "Oh yes, greatly for some years past." On further inquiry I found that she had suffered much of the time from heavy pain in the right cheek, watering of both eyes, especially the right, and an abnormal discharge from both nostrils which was somewhat increased by lying on the left side. She also complained of a distressing pain under the "bridge of the nose" or between the eyes. She had lost her relish for food because of the nauseating effect of the catarrhal discharge which seemed to take place posteriorly into the pharynx as well as anteriorly; the sense of smell was impaired, and her breath had become exceedingly offensive. I could not well be mistaken in my diagnosis. Disease of the maxillary sinus involving the spongy bones of the ethmoid was clearly indicated by the symptoms.

My patient being advised of her condition consented to the extraction of the discolored molar as the first step in the course of treatment to be pursued.

As anticipated, the pulp was found to be dead.

The apical portion of one of the roots was "absorbed," with a circumscribed line encircling the foramen.

This line marked the union of the peridental membrane with the soft tissues surrounding an opening into the antrum which was the outlet for the gases and putrescent matter that were being generated and thrown off from the dead pulp. After greatly enlarging this opening, a bulb-syringe was employed for injecting warm water into the antrum, which forced a mass of corruption through both sides of the nose. By placing her head well to the left while washing the antrum it was found that the greater discharge was from the left side. This indicated that the bony wall of the septum had been broken down, or was at least perforated. The loss of the sense of smell indicated that the olfactory filaments distributed in the mucous membrane covering the spongy bones were either destroyed, or their sensibility blunted.

As the liquids used in cleansing the antrum passed so freely into the nose I concluded that the ostium between those cavities must be greatly enlarged, and perhaps the bony wall partially broken down.

The treatment of the case consisted in drenching the antrum at first, daily, with antiseptic washes. A month later the diseased condition of the cavity was found to be rapidly giving way, but the distressing feeling between the eyes still continued, though greatly

diminished. Believing that the disease was now almost entirely confined to the spongy bones of the ethmoid, and there being no rhinologist in the town with whom to consult, I called Dr. Young, a skillful oculist and aurist, to my assistance.

After each cleansing operation with liquids the nasal passages were anointed by Dr. Y. as thoroughly as possible with vaseline, containing about one per cent of eucalyptus.

In a few months the discharge subsided and her health, which had rapidly been giving way, began to improve, and at the present time the diseased parts seem to be restored to perfect health, but evidently not without loss of considerable ethmoidal tissue. As evidence of this the voice is somewhat changed, having something of a hollow or muffled sound.

Most of us have noticed that persons who are suffering from chronic catarrh in the head have the modulations of their voice thus impaired; so with one who is quite dull of hearing, we have only to hear him speak to know of his infirmity.

I have quite a number of cases in practice, some less and some more aggravated than the one I have related above, and it was my purpose on commencing this paper to report them at this time, but they are so similar in character that I have concluded it quite unnecessary to do so.

In two of those cases the disease had evidently extended to the frontal sinuses, and although the ulceration of the antrum gave way, the catarrhal discharge continued, though in a very much abated form. The pain and distress, as well as the abnormal discharge from the antrum, ceased, while between the eyes and above the "bridge of the nose," it continued.

But little, if any, light has been thrown upon pathological conditions of the ethmoid, either from vivisection or from post-mortem examinations. The structure occupies a position too near the citadel of life for the former, and for obvious reasons is rarely if ever resorted to in the latter, although the spongy bones could readily be reached, without disfiguration, by the removal of the cribiform plate, gaining access through the cranial cavity; but I have never known of such an examination being made.

A very accurate knowledge, however, of diseased conditions of this bone may be ascertained without such examination, the symptoms above given being unmistakable in their character.



As an interesting incidental fact, I may state here that the discovery has been made, by the examination of mummies, that the ethmoid bone was always removed by the ancients before embalming their dead.

This was done in order to remove the brain without disfiguration, afterward filling the cranial cavity with embalming drugs, showing the intimate relationship of this bone to the brain.

I do not pretend to say that dental lesion is the usual cause of pathological conditions of the ethmoid, but I have no doubt as to its sometimes being a factor, and at other times the sole cause of the disease, and that, too, in some of the most aggravated cases. I can recall at least a dozen cases in practice where nasal catarrh had been unsuccessfully treated for years when suppuration of the maxillary sinus, resulting from diseased molars containing dead pulps, was found to be the cause of the malady.

The statement by some writers that suppuration of the antrum is the result of rhinitis would come much nearer the truth if reversed.

If the maxillary sinus is diseased and there is a purulent discharge into the nose from that cavity the septic matter thus thrown upon the mucous membrane will irritate, and sooner or later cause ulceration of the surface over which it flows.

The extension of the disease, then, from one anatomical part to another is not so much from continuity of tissue as it is from actual contact with virulent matter thrown upon normal tissue in its way of escape from the seat of the disease.

There can be no doubt that diseases of the nose may in various ways close up the natural opening from the antrum into the nasal cavity, thereby causing engorgement of the sinus, and a diseased condition of that cavity follow as the result. But such cases are exceedingly rare as compared with those that have their origin in diseased teeth.

At least 90 per cent of the cases met with in my practice were traced directly to the roots of diseased molars, and in those cases the disease had passed from the teeth to the antrum and from the antrum to the nose, involving in some cases the spongy bones of the ethmoid.

On the other hand, a purulent discharge from the nose cannot reach the mucous membrane of the antrum, while suppurative matter from the antrum is voided into the nares and must have its vitiating influence upon the mucous membrane of that cavity. Nor is

the poisonous effect of the discharge imparted to the anterior part of the nares alone. Different positions of the body during sleeping hours expose the "lateral masses" and the posterior nares as well to the acrid matter.

It is not strange that the paper-like walls of the ethmoid should be liable to destruction from chronic ulceration of their mucous membrane, as the periosteum is so directly exposed to the ulcerative process. And when this loss of tissue takes place the sense of smell must, to a great extent, go with it.

The destruction of the osseous tissue doubtless usually takes place from caries and not from necrosis, except where the mucous membrane and periosteum of both sides of the fragile walls are destroyed, near or at the same time.

The treatment of pathological conditions of the ethmoid is not an easy matter. The inaccessibility of the parts makes it exceedingly difficult to apply effectually the cleansing agents so necessary for successful treatment.

In all cases of nasal catarrh it is well to examine with care the condition of the teeth, and if pulpless molars are discovered, the condition of the antrum should receive careful attention, and if an abnormal condition is found to exist here, the symptoms in the case point with almost unerring certainty to the diseased teeth and the antrum as the original cause of the nasal malady. The treatment of the case then, should commence with the teeth and the antrum. But removing the cause does not usually remove promptly the effect that has been produced.

The extension of the disease will require extension of the treatment, and nature, the greatest physician, will usually do her part of the work in effecting a complete cure.

Wisely the spongy bones of the ethmoid are so arranged that gravitation aids greatly in draining away the acrid matter. Antiseptic lotions should be used daily, after which the parts should be anointed, as well as can be with vaseline containing about one per cent of eucalyptus. This is to avoid the scalding effect of the catarrhal discharge upon the mucous membrane over which it flows.

I am more impressed with the importance of the subject under consideration when I remember that at least a half-score of such cases have come under my treatment during the last two decades, and in all of those cases the general health was rapidly failing, and with some life had become a wearisome burden.

On dismissing one of those cases a few years ago, I requested the lady to write me in six months and state her condition at that time.

Promptly at the time named the letter came, containing the following statements: "When I visited you six months ago, I was a wreck. I had given up my household duties, and instead of being a blessing to my family I could but feel that I was a burden. My breath was so offensive that I was compelled to isolate myself, as much as possible, from my family. A gloom settled down upon me, and I felt, as did my friends, that my days were numbered. Now I do all my household work, and enjoy excellent health, and feel that I am once more a blessing to my family."

If I have succeeded in this paper in calling the attention of both the medical and dental professions to one of the causes of pathological conditions of the ethmoid, known as "nasal catarrh," and in doing so have been able to throw some light upon a hitherto neglected view of the subject, I shall feel that my effort has not been in vain.

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#### THE PLACE OF THE CEMENTS IN DENTAL THERAPEUTICS.\*

By A. H. THOMPSON, D. D. S., TOPEKA, KANSAS.

The substance of this paper was presented before my own State society some three years since, and the conclusions then offered have been so abundantly confirmed by subsequent experience, that it is a pleasure to submit them again with such modifications and additions as that experience has suggested.

The value of the cement in our therapeutics has become so great and our use of them so extensive, that it is superfluous, at this day, to defend their employment. They render such assistance in so many operations for the treatment of the diseases and preservation of the teeth, that the importance of their properly-defined position cannot be questioned. We need now a fuller knowledge of their possibilities and of their various serviceable qualities, and to this end every contribution to our knowledge of the subject is of value. We need original observations as to the working peculiarities of the zinc cements, the place in which they can be used to advantage, what those advantages are and the reports of experience as to serviceability and durability. From our manufacturers we require more uniformity in their products and closer adherence to the good and tried formulas. In the choice of

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\* Read before the Iowa State Dental Society.



cements it is best to adhere to those brands which have been most satisfactory and durable in your own hands, and leave the new-fangled, untried preparations to the dealers. It is always best to stick to old friends.

The first prime quality of the zinc phosphate cements, the one which is of greatest value in their employment as a filling material, is that of clinging to the tooth substance—the main characteristic of a true cement. This tenacious attachment necessarily forms a closer and better contact than is possible with any other filling material. The contact of all other materials is a mere mechanical juxtaposition which cannot be air-tight and only approximately moisture tight. Capillary attraction will draw in moisture around all mechanical fillings that depend solely upon manipulation for such a contact, except, perhaps, those of the very finest workmanship, but there are very few fillings that attain this ideal perfection. Then again, as moisture comes also from the tubuli of the dentine, drawn by capillary attraction, it follows that mere mechanical exclusion can never be absolute. With the phosphate cements, however, the principle of adhesive contact, by which the filling becomes as one piece with the tooth substance to which it clings, the exclusion of moisture and the consequent prevention of caries is absolute. Not only is the external moisture perfectly excluded and capillary flow prevented, but the very orifices of the tubuli are closed and moisture even from that quarter shut out. No other materials which we use for filling possess this invaluable quality in the slightest degree, and its great value will be apparent as we describe the situations in which the cements ought to be employed.

This is apparent first in their use in lining large cavities and strengthening weak walls. For this purpose they have been in much repute, and extensive use for some years. It is a good rule in practice that all cavities, where depth will permit it at all, should have a layer of cement in the deeper portions. After preparing the cavity—leaving the softened dentine over the pulp in deep cavities—cement is carefully placed in contact with all the inside while in a sticky, clinging condition, and the cavity nearly filled with it. After hardening, the cement is cut out to sufficient depth to retain the metal filling and the margins carefully finished. In teeth of soft structure the cement lining will insure their better preservation, for it is a well-known fact that in such teeth caries will nearly always return under the metal fillings. Gold cannot be condensed

against the walls sufficiently well to exclude moisture and the dentine itself is like a sponge, while amalgam, when it prevents caries at all, does it by hardening these soft tissues by impregnating them with the salts of its decomposition and consequent discoloration of the tooth. In such teeth, better preservation is insured by lining with cement and thereby excluding moisture from all sources by absolute adhesive contact. This is accomplished by filling the cavity to the enamel margins with cement and allowing the metal to come in contact with that tissue only.

The contour of the tooth can often be preserved by filling overhangs of enamel with cement, which will strongly support such weak walls and thus reduce the size of the exposed filling. Thus the labial walls of proximate cavities in the anterior and buccal teeth should be lined with white cement to support and retain the tooth substance and give the tooth a lighter color. The corners of incisors which are weak and thin can be preserved in this way, the gold being carried around the enamel to bind it in. This makes a much more artistic operation than the old system of remorselessly cutting away all weak walls and exposing a mass of gold. In the molars also, deep overhangs can be supported with cement, and the natural face of the tooth be preserved for the more effective performance of the functions of mastication.

There are many other places also in which it can be employed to advantage, and it should be made a rule to place it under all fillings where there is sufficient depth of cavity to permit of its use. An additional reason for this is that it is a non-conductor of thermal changes, and will prevent shock to the pulp from the too near approach of metal.

The next important quality which we notice is that by some chemical action or influence not yet understood, the dental tissues under phosphate cement in time really become harder and drier by contact with it, thereby rendering the tooth better able to receive the impact of filling with gold, and more resistive of caries afterward. Perhaps the phosphoric acid of the cement is the very element the tooth tissues require for increase of density, or other chemical combinations are brought about which answer the same purpose.

Probably the hardening is caused by a mere saturation of the soft tissues by the cement when liquid, but whatever the cause the fact is sufficiently assured to make it a practicable working prin-

ciple. For the purpose of accomplishing this hardening in very soft teeth the zinc phosphate is employed and allowed to remain for some months, and renewed from time to time when seemingly necessary.

Not only is this hardening treatment indicated in the soft and structureless teeth of many adults, but it is especially applicable for the filling of the permanent teeth during childhood and adolescence when the dental tissues are soft and immature. As we well know the teeth are much less dense and solid at eruption in childhood than after the maturity of the individual, the teeth naturally partake of the nature of the other bony tissues and solidity during the growing years, becoming more dense as age progresses. For this reason there are few cases in which the teeth are sufficiently dense to allow of being filled with gold with any hope of permanence, before puberty. Occasionally small fillings of gold can be made on the grinding surfaces in dense teeth at an early age with a prospect of durability, but rarely large fillings in any position. How often have we seen large fillings fail in the proximate surfaces when put in for children, and how seldom do they succeed! Then again we must consider the danger of subjecting children to prolonged operations; and that each succeeding generation as it appears in the families of our *clientele* is less able to endure nervous fatigue or shock. Therefore we contend that the permanent teeth should be filled with phosphate cement during childhood and adolescence that the teeth may be hardened both by nature and art and that suffering may be saved to the blessed children. Of course there are exceptions when small gold or amalgam fillings may be put in with safety, but it is very rare that the teeth in childhood should be filled with gold. The first molars for instance, which nearly always decay early, and sometimes the incisors, should be filled with cement and renewed when necessary until the teeth become sufficiently hard and the child becomes sufficiently strong, to endure a permanent operation. As soon as possible the molars should be filled with amalgam which can remain until after full maturity when it can be replaced with gold. And then the gratification of having the confidence and gratitude of the children by saving them suffering and keeping their teeth comfortable, is the crowning reward among the advantages of this method of treatment, to say nothing of the banishing for life of that senseless and annoying



timidity regarding dental operations, which is so wearing on us and is the bane of our existence.

Then again, the durable cements are especially valuable for filling the deciduous teeth in young children. With the little three and four-year-olds, perfect cleansing and preparations of the cavity is rarely practicable and often quite impossible. Cement can then be used with good results until the sensitiveness of the tooth is overcome and the confidence of the little one gained so that a better cement filling can be made, or perhaps of amalgam. The soft and porous nature of the deciduous teeth indicate the use of cements, especially as it is always necessary to leave as much tooth substance as possible in the direction of the pulp, for this organ is certain to perish sooner or later under large fillings in these teeth. Cement linings are necessary under large amalgam fillings to support the soft and frail walls and protect the pulp. When the pulp dies and the tooth becomes a shell, cement makes a better root filling than anything else and supports the frail tooth as no other filling can. The tooth can then be finished with amalgam or crowned, for it is imperatively necessary for the child's health that the baby molars should be preserved for mastication until the first permanent molars are all in place, at least. Children are better chewers than adults for the act gives pleasure to the jaws, and the habit is a valuable one to get well established for the good of the future health.

To pass suddenly to the opposite end of life, when the teeth of the aged have become soft and often extensively carious and when the individual is unable to endure severe or long operations, the cements are the best of filling materials. They answer an excellent purpose in the preservation of senile teeth and are readily renewed without severity on the aged patient, when they do waste away. In some mouths they last better than in others, of course.

Or with invalids who cannot endure any painful or protracted operations—and whose teeth are often unfit for good fillings of metal—cement answers the best purpose for tiding over the time until the patient and the teeth are in better condition. If both do not recover, it is best to renew the cement as it may wear or dissolve away. During pregnancy and lactation it should be used also until the teeth recover their normal tone and the patient her wasted strength, for metal fillings are contra-indicated at this time.

Another important use of the cement is in the treatment of sensitive dentine as a temporary filling material. For this it is absolutely unequalled for safety and efficiency. A sensitive cavity can be filled for one or two weeks and the sensitiveness reduced so much, in most cases, as to permit of comfortable and thorough operating. Occasionally the pain persists, especially in nervous subjects or in buccal cavities, and the cement will need to be renewed, but it will pay to do this two or three times for the comfort of the patient and the safety of the pulp. Excessive sensitiveness should always be allayed, not only for the comfort of the patient, but for the safety of the tooth and pulp, for there is danger in the irritable condition of the dental tissues. If there is forced preparation and filling of the cavity when great sensitiveness exists, with or without obtundants, there is likely to be annoying after sensitiveness to thermal changes and the constant shocking will ultimately result in congestion and death of the pulp. This is a result that occurs too often as a sequel of the forced filling of sensitive teeth, for the danger is ignored in theory and practice. It may be said that no tooth which has been filled when very sensitive and remains tender afterward, is in a good condition or that the pulp is safe. Even if the sensitiveness is temporarily allayed by obtundants it will return when it recovers from the effects of the anæsthetic, and the tooth will be sensible to thermal changes. Therefore it is the best practice to permanently allay sensitiveness of the dentine and this can be done effectively and safely by the use of zinc phosphate cement, and accomplishes this probably by the exclusion of air and other irritants, the prevention of thermal shock, the neutralizing of the product of carious fermentation and the impregnation of the dentine by the fluid cement and subsequent hardening. The permanent operation can afterward be performed with comfort to the patient, with safety to the tooth and satisfactory thoroughness to the operator. And last, but not the least of the many advantages of this method of the positive reduction of sensitiveness, is the comfort the operator experiences in deliberate and thorough work without the harrassing protestations of the suffering patient. He otherwise either consciously or unconsciously stops short of that thoroughness which he would attain, were the operation painless. Hence it is that so many fillings that fail have a history of painful work when inserted, and we cannot but feel that they failed because the operator stopped when "it would do" and did not carry out the

preparation of the cavity satisfactorily to himself. And we do not blame him. On the contrary our heart goes out to him, for we well know that he suffered also. Therefore we claim that it is demanded by all the rules of good practice that sensitiveness should be reduced for the comfort of the patient, the safety of the tooth and the satisfaction of the operator, and that the best material with which to do this is phosphate cement.

It has been objected that the cements when used for this purpose, are liable to produce death of the pulp, but it has been noticed by the writer, in an extensive use of the zinc phosphates that such a result does not occur any more frequently than with any other temporary filling material. Devitalization does not follow except when the pulp is in such a condition as to render its death probable under any filling. Aching pulps are sometimes, though rarely, preserved alive permanently under favorable conditions in favorable organizations, and the zinc phosphates do not show a larger percentage of dead pulps than any other material. The precaution should, of course, be taken in exposure of the pulp, and even in very deep cavities, to interpose a protecting cover of carbolized paper, or film of gutta-percha, to prevent irritation, for no one claims that it would be safe to stop an exposed pulp with a dab of zinc phosphate or any other irritant. If perfectly protected the pulp is as safe under cement as under any filling.

But after the pulp is dead, comes the last use of the cements to be enumerated—that of filling pulp canals. It has been the writer's custom for some time to fill pulp canals with a mixture of oxy-chloride of zinc and iodoform, and like the advocates of all other pulp-canal filling materials, has had no failures with his favorite! The reason for preferring the oxy-chloride to the oxy-phosphate is obvious, in that the chloride being a powerful coagulant as well as an antiseptic, places the contents of the tubuli and the stump of the pulp at the foramen, in the best condition to resist decomposition. Then the iodoform is present to destroy any septic poisons that might arise—especially the ptomaines, for which it has a special affinity. Iodoform has been under a cloud since Dr. Black's investigations of the antiseptic power of the different popular antiseptics, but it is regaining favor as the destroyer of cadaveine, the ptomaines, and toxic products of germ fermentation. So we consider its use especially indicated in the pulp canals of teeth. The writer has just lately begun the use of lead points in connection



with this mixture, which also has antiseptic qualities, the oxy-chloride should not be used at any time in a live tooth, on account of its irritating power, but it is especially and only indicated in the filling of pulpless teeth.

As a permanent filling material, cement has not, as yet, much value, although the durable kinds in favorable mouths frequently last a long time. But so much depends upon the quality of the oral fluids that no confidence can be placed in their durability and no estimate of expectancy can be made. Yet there has been such rapid improvement in the durable qualities that we can promise more permanence in mouths in which we know by observation that cement has lasted well. In crown and bridge-work and for porcelain inlays, the quality of permanence is indispensable, and fortunately in these branches, the cement is so little exposed, either to solution or mastication, that it is serviceably permanent. We have all seen cement fillings that have lasted for years, and there is no reason why a cement cannot be made which will last in any and all mouths and in all positions. It will dissolve at the cervical border with the best of care, or will wear away where exposed to mastication in most mouths.

We conclude, therefore, that the zinc phosphate cements, and occasionally the oxy-chlorides, are very useful adjuncts in our work of saving teeth. That they have increased our efficiency there is no doubt, for they render it possible to preserve teeth that could not be saved before the days of the cements. Let us hasten to acknowledge our indebtedness to this humble material and recognizing its importance, endeavor to develop its capabilities to a yet greater degree and thereby extend our usefulness.

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#### PROTECTION OF THE DENTAL PULP.\*

By L. F. KELLOGG, D. D. S., MARSHALLTOWN, IA.

Much has been said and written of various materials and methods employed in capping the dental pulp when exposed or nearly exposed in deep-seated caries.

Indeed, so much is extant on the subject, that many young practitioners are undecided as to which method to employ and perhaps adhere to means entirely unscientific and contrary to physiological laws, and by so small a degree of success, become dis-

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\* Read before the Iowa State Dental Society.

couraged in trying to conserve pulps that *may* be easily saved and meet troubles that *might* be averted.

The object of this paper will be to point out some of the principles involved in protecting the dental pulp in deep-seated caries and a method of meeting the requirements in the so-called safe cases, leaving for some one else to demonstrate the feasibility of saving congested, aching pulps or parts of pulps, or where, from any cause, there is much general debility.

Would any practitioner of experience expect the same degree of success in saving pulps exposed, or nearly exposed, in women's teeth during gestation, as before or after such period?

The writer has met failure repeatedly when unexpected in such cases. Or in the teeth of people of bilio-lymphatic or lymphaticonervous temperaments, as in those of sanguo-bilious? Certainly not. Therefore the physical condition and temperament of an individual should be taken into consideration before attempting to conserve an anywise doubtful dental pulp.

The principles are simple, yet many times not fully appreciated. The methods easy, yet not always rightly applied. In fact, with all the knowledge extant on the subject of capping pulps, without tactile skill to apply it, nature with all her kindness will not overlook our manipulative defects, and failure will result. In a capping we want a non-conductor, a non-irritant, something having anti-phlogistic qualities and easily applied. In its application we want perfect dryness, contact without pressure, and sufficient quantity to serve the purpose for which it was intended.

In case where we expect a small exposure in a deep-seated cavity of decay, the frail part of the operculum of the cavity should be first removed, that good vision may be secured and the loose cavity contents should be syringed out with tepid water, directing the stream obliquely into the cavity. The cavity should then be carefully excavated, cutting mostly from within out, and thus avoid lifting up large pieces which might cause a larger exposure than desired.

The point of exposure should be carefully guarded against accident and a soothing antiseptic and antiphlogistic remedy applied, to render the point of exposure and cavity of decay aseptic.

Recalcification of the semi-decalcified dentine will then generally take place. Avoid strong coagulants, which prevent recalcification. For a dressing various remedies may be used, as oil of

cloves, dilute carbolic acid, etc., but at present I use campho-phenique, full strength. In case of slight trouble before presentment, I leave this as a dressing for twenty-four hours. In case of no previous trouble or an exposure by accident, I fill at the same sitting, but treat the cavity of decay in the same manner for a few minutes to render the semi-decalcified dentine aseptic, and destroy oral disease germs that in imagination or reality may be menacing the future health of the tooth. The principle of aseptic surgery must be followed out in either case. The material I use most in capping exposed pulps is made according to Flagg's formula for zinc sulphate. The powder consists of calcined sulphate of zinc, pulverized to an impalpable powder, one part, and calcined oxide of zinc two or three parts, and these thoroughly tritured.

The fluid consists of gum arabic 15 gr., water  $\frac{1}{2}$  ounce; after it is thoroughly dissolved add one gr. of sulphite of lime and filter.

The parts should be kept dry and a thin mix made of the cement, and a portion placed accurately over the point of exposure and the frail dentine surrounding it.

A short time should be allowed for the capping to harden, when it may be covered with oxyphosphate or any suitable non-conductor, to give sufficient depth of non-conducting filling to break off thermal changes. The balance of the cavity may be filled as indicated.

I think when due care and skill have been used in the successive steps it is unnecessary to insert temporary fillings.

The next class of cases requiring pulp protection are more numerous, and in most cases simply met.

The layer of partially disintegrated dentine in closest proximity to the pulp should not be disturbed. After sterilizing, varnish the cavity; especially when oxychloride or oxyphosphate cements are used, as the fluids of these cements when allowed to percolate into the porous dentine in such close proximity to the pulp, will sooner or later cause pulpitis, and subsequent death of the pulp.

Most of my failures in such cases, in the early years of my practice, I ascribe to the too close proximity of these irritating cements to the pulp without intermediate protection. The varnish lining proves sufficient protection against thermal changes in many cases, but in deep cavities is insufficient.

Cement should be used in such cases, especially where gold is to be used as the filling material, as the hard substance furnishes protection from mechanical injury during the insertion of the gold.



There are times in amalgam work when we need a non-conductor more easily applied, equally effective, and which consumes the minimum time in its application. I think we have it in the use of asbestos in the following manner: Cut small pieces of asbestos paper about the thickness of card-board and of the desired size. Touch one side of the pad to sandarac varnish and apply the varnished side to the desired spot; it adheres, and more pads may be applied until the desired quantity is in position, then pack the amalgam tightly in and we have a non-conductor "par excellence" to meet a large number of cases where simplicity and expediency are especially desirable. I have used this means for some time, with very gratifying results. In amalgam work, where there is any liability of trouble from thermal changes, I can quickly apply the asbestos pad.

Perhaps dryness should always be maintained throughout, as asbestos is an absorbent of moisture, and unless care is taken in this particular, it might become an irritant instead of a protection to the dental pulp.

Many other excellent methods are employed in overcoming thermal changes and conserving pulps, and as the clinical success of any method is the crucial test, one who is successful with *his* method of saving pulps that *may* be saved should adhere to it, at least until he has found something superior and nearer the ideal. If this, my maiden effort before this body, will cause discussions, that will help some one solve this problem who is addicted to the too free destruction of the pulps of teeth, I will feel it has not been in vain.

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#### COPPER AMALGAM AND OTHER FILLING MATERIALS.\*

BY C. G. EDWARDS, D. D. S.

Copper amalgam being designed by the committee to be the chief subject of the paper, it must needs be more of the nature of a report or compilation, than anything resulting from an extended experience personally, with this new, yet *old* stopping.

In using the term copper amalgam, let it be understood that only that compound containing pure copper and mercury is meant, and the term shall have no reference to ordinary amalgam containing copper. Copper amalgam, while somewhat new in American dentistry, new in practice, not in theory, for while the masses

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\*Read before the Kentucky State Dental Association.

of American dentists read but little, yet there is a goodly number of progressive or scientific men, who have been more or less familiar, theoretically, at least, with the material for many years. They were slow, however, to adopt it in practice for various reasons, not necessary to embody in a paper. In England it has been used for 40 or 50 years, and has, I might say, been the favorite plastic with the dentists of that country; and was known 40 years ago as "Sullivan's Cement." Notwithstanding these many years of use abroad, singularly enough, the formula remained unchanged and unimproved until its adoption somewhat generally in our country. And can we say this change is an improvement? So far as cleanliness and manipulative properties are concerned, yes! As to the conservative elements, so much to be desired, time alone must but prove.

Although this material has been used but four or five years in America, and not generally for a longer period than one or two years, its production and consumption has increased enormously. As well as I can ascertain, two and a half years ago, not more than 200 ounces were consumed per year. The succeeding year about 4,000 ounces were used, and last year the estimate was for 10,000 ounces.

Copper amalgam should contain only pure copper and mercury. The old method of manufacture was by precipitating copper from its solution of sulphate by means of plates of iron or zinc. This method naturally resulted in the presence of traces of either iron or zinc. Another objection to the old method was the difficulty of controlling the size of the grains of copper deposited, some being very coarse. Copper resisting the action of mercury, the larger its particles, the greater the difficulty of amalgamating it. The latest, and it would appear, the better method, is to precipitate the copper from its solution by means of electricity generated by a battery or dynamo, resulting not only in chemically pure copper, but providing the current be properly regulated, the deposit is an impalpable powder, which greatly facilitates the amalgamation, which is accomplished by thorough trituration with pestle in a mortar.

This accomplished, the surplus mercury is squeezed out through chamois skins, successively heating triturating and squeezing, until after setting or crystallizing, the requisite density shall be attained. The more free mercury removed the greater will be the density and edge strength. By frequently repeating this process

the density of ordinary amalgam can be reached. It is now copper amalgam, ready to be prepared for fillings. This process is of no less importance than that of its manufacture, for herein lies the possibilities of success or failure. Heat is required to soften, and trituration to render the mass plastic. It is conceded that an excess of heat is injurious by driving off too much mercury and the oxidizing of the copper. The heat, therefore, should be very low and gradual. I use a broad, thick spatula for holding the mass over the smallest flame I can produce with an alcohol annealing lamp, and when mercury appears all over the surface in small bead-like globules, I place it in a mortar and rapidly triturate for about a minute, finishing the process in the palm of my hand. The material, provided the heat has not been excessive, will then be a soft, smooth, gray mass, easily handled and introduced, provided the cavity is not very inaccessible, and taking but a few moments to complete. In the case of difficult, inaccessible cavities, requiring more time to introduce it, the heat can be raised a little higher, when the globules of mercury will be larger, and they may coalesce, resulting in a soft plastic, with every appearance of a decided excess of mercury, some of which may or may not be squeezed out, it appearing to make but little difference in the resultant filling after hardening. When in this very plastic condition crystallization is retarded, thus requiring a greater or less time in proportion to the softness of the mass. It may take twelve to twenty-four hours to fully crystallize. Push the heat still higher, and material injury may result. The mercury may be vaporized, and the copper oxidized. The principal objection to using it in a very plastic condition is the liability of injury—displacement of particles, exposing marginal edges of cavities before crystallization takes place.

Another method of rendering the mass more plastic than we wish in ordinary cavities, is by adding a small amount of mercury to the smooth, soft, gray mass. This is admissible in those preparations known as dry copper-amalgam, dry by virtue of containing a minimum amount of mercury.

Copper amalgam becomes more or less discolored by exposure to the normal fluids of the mouth, the color varying from a bronze to jet black, the depth of color depending upon, first, the excess of copper, and second, upon the condition of the fluids in which it is bathed.



The discoloration is not always constant ; if the secretions are abnormal or acid, the fillings may remain bright and untarnished and exhibit wasting on the surface, due to the more or less continual action of acid secretions. This signifies a solution of the copper and either a liberation or solution of mercury as well. When these conditions prevail in a mouth containing a number of such fillings, may we not pause and inquire if evil consequences may not result therefrom.

I think no reasonable doubt can be entertained but that, under such conditions, the evils accruing, directly or indirectly, to the organs of the mouth and through them to the general system, may be positive. We should appreciate and fully recognize the necessity of careful discrimination in the application of remedies lest they create disease when intended to cure. The discoloration of copper-amalgam fillings is probably due to formation of sulphate of copper, which appears to be the active agent in resisting secondary caries in somewhat the same manner probably that the chloride of tin is supposed to accomplish the same result by filling the open ends of the tubuli and hardening the dentine. Not only this, but it has been demonstrated by Miller that copper-amalgam is an antiseptic, and this property is more or less constant, as evidenced by careful experiments with not only old copper fillings, but particles of dentine which had been in contact with such fillings manifested decided antiseptic properties also.

In Dr. Miller's experiments, copper amalgam stood alone in this respect in contrast with all other filling materials. As to the shrinking or change of form of such fillings, there is, as in most questions, a division of opinion. To test the question, so far at least as to the make used in practice, I have, for the purpose of this paper, made a few experiments by filling small sections of glass tubing. You can witness the result as they are passed around.

First, I prepared the material as I prefer to use it in practice—a soft, smooth, gray mass without luster. Second, quite soft, with full luster of mercury. Third, very soft, pressing out all the mercury I could.

To contrast this with ordinary amalgam, *i. e.* a gold and platinum alloy, so called. I also filled a tube with this; finishing off with tin foil. One more was filled with a different specimen of unknown quantity and quality. After these tubes had been filled three or four days they were placed in carmine ink, and allowed to

remain for over 48 hours. As you can see, there are traces of ink around all the fillings, though less marked on the alloys than the copper fillings. I shall carefully test these specimens again after months have elapsed, and note any changes that time may bring. The filling which I finished off with tin foil appears not to have leaked at that surface, the leak having occurred at the other end of the tube, and that probably from faulty manipulation. I almost invariably finish my alloy fillings with tin. The result in this experiment confirms my opinion of the benefits derived from a tin surface on approximal alloy fillings. At a subsequent sitting or an hour after inserting, it can be burnished, though amalgamated to some extent, it retains to a certain degree its malleability; therefore is capable of being condensed and spread under the burnisher. Such fillings retain their color better than either the alloy or pure tin. While my limited experience in practice with copper amalgam does not prove anything positive, I can but acknowledge that, so far as I have had the opportunity to observe results, they have not been disappointing.

I have witnessed no evidences of shrinking of fillings in the mouth, no tendency to bulging, creeping or crawling, as we not unfrequently see in the ordinary alloy fillings. I have therefore arrived at the following conclusions in regard to it, and am governed in a large measure by the experience of other careful and capable observers. That *judiciously* used it is a valuable acquisition to the list of plastic fillings. It is more easily manipulated than other amalgams in difficult inaccessible cavities, such as occur in the approximal and buccal surfaces of molars, extending under the gingiva; and also in children's teeth, where at times it is impossible to thoroughly excavate cavities and fissures. It requires less pressure to make it solid and adapt it to the walls of cavities. It is non-irritating, therefore is safely used in deep and sensitive cavities, and it possesses antiseptic properties. It would be singular, indeed, if this material, with its advantages, had no disadvantages, the chief of which is its objectionable color, which may not be confined to the filling alone. In some cases it penetrates into and stains the dentine, and not necessarily immediately, for it may and does occur several years after insertion, and finally, if used in large quantity in connection with acid secretions, while it saves the teeth it may kill the patient.

As to other alloys, there would appear not to be very much difference; in testimony thereof, recall the long list of such materials, and each particular formula has its advocates. Each and all may possess merit. Many of these formulas are carefully compounded—the formulas arrived at by actual experiments, therefore the results attained with them depend largely on the amalgamation or preparation by the operator. In order to produce the best results possible, there should be no surplus mercury, *i. e.* when the mass is amalgamated it should not contain mercury that can be squeezed out—but mixed as dry as it is possible to handle and manipulate it. When mercury is squeezed out, the more soluble constituents of the alloy, are carried out with it, and it is no longer what it was intended to be. By thorough, hard burnishing, particle by particle into the cavity, the filling is not only made solid, but a uniform mixture of alloy and mercury is produced, any surplus of the latter being on the immediate surface, and though this condition may not appear to the eye, it will be manifested by placing a pad of tin foil thereon, and hard pressure applied; the foil will crumble and more or less will be adherent to the surface of the filling by judicious burnishing. The glaring cause of failure with amalgams, I believe to be due more to the careless and unskillful manner of their preparation and manipulation by the operator than by the inherent defects of the material. Because it is “only amalgam” the necessary care is neglected, not only in its manipulation, but in the preparation of the cavity as well. This should not only be as carefully performed as if for gold, but even more so, for it is well understood that the marginal edges should be shaped differently from that required for gold. When we learn to appreciate and to practice these important truths and to charge suitable fees for services rendered, taking due time for each process in the operation, we will not hear, I ween, so much of fillings shrinking, bulging, creeping and crawling out of their cavities.

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Since the use of Guaiacol for internal medication has been widely adopted, efforts have been unremittingly made to produce absolutely pure guaiacol and many and various tests devised for controlling the products commercially produced. The latest and simplest test is suggested by Pio Marfori (“Annali di Chimica”) as follows: Mix a drop of guaiacol with several drops of chemically pure sulfuric acid, and the mixture will assume a constant purple color; if the guaiacol contains even the slightest trace of creasote, the resultant color will be a dirty grayish-green. This test is considered especially valuable because it is almost alone applicable to guaiacol of allied products.



## PROCEEDINGS OF SOCIETIES.

## IOWA STATE DENTAL SOCIETY.

*(Continued from page 482.)*

## DISCUSSION ON "LOCAL ANÆSTHETICS AND PAIN OBTUNDENTS."

DR. I. P. WILSON: The lady upon my right just now remarked, as Dr. Abbott made his statement that with the profession it was a question of vital importance, "It is a question of vital importance to the people."

Now, I endorse all that has been said in denunciation of this practice of injecting drugs into the circulation, but wish to refer to another form of local anæsthesia that I do not think was mentioned by Dr. Ingersoll, viz: the ether spray, or freezing process. We frequently find patients with discolored teeth indicating dead pulps and no reason assigned for this condition. I recall two cases now, or rather one case of two teeth—where two central incisors with small gold fillings were discolored. I inquired if the nerves had been destroyed in the teeth and the patient said no. On further inquiry I found that they were sensitive and the ether spray had been used very freely at the time the excavations were made for filling. That is but one case, and yet quite a number of such have come to my notice in my practice one time and another. As has been stated, the delicate organ of pulp will not bear any rough usage, and I am satisfied that even the ether spray, which is considered so harmless, may, and frequently does, cause destruction of the pulp; so that while I once used it quite extensively I have ceased its use as a pain obtundent for sensitive dentine. I had one case a few years ago when cocaine was first being introduced into the dental profession, where I applied it very freely in a test case to see if I could not obtund the sensitive condition of the teeth. I applied it several times in fifteen or twenty minutes and found but little satisfactory results, not as much as if I had kept the teeth perfectly dry that length of time. I proceeded at last, however, to fill the tooth in the ordinary way and a few days later the lady appeared with that tooth discolored the deepest red color, or purplish color I ever saw in teeth. You can imagine my feelings when I discovered the condition of that tooth. It was a distinct discoloration indicating that the tubuli were filled with blood and I was unable to entirely bleach it. I have known of one or two other

cases of this kind in the hands of other operators so that I am disposed to endorse all that has been said in denunciation of many of those local anæsthetics; and especially so when anything is done to destroy the vitality of the entire pulp temporarily, or when we inject into the circulation. I believe that carbolic acid and preparations of that kind when applied to the terminal points of nerve tissue will devitalize those points and thereby destroy the keen sensitiveness that would otherwise be experienced.

DR. L. C. INGERSOLL: I want to say a word or two about Dr. Abbott's advice to lie. Is it a lie? Is it not telling the absolute truth when he says "I applied it for the purpose of relieving the pain?" It probably will relieve the pain and you know as a fact it often does; yet, when you apply any local anæsthetic, you cannot say it relieves the pain when it sometimes increases it. When we know so little about any drug we are not lying when we make an observation that is based on general experience. One of the best anæsthetics in the world is the confidence the patient has in the operator; the best anæsthetics in the world (and we have a great deal to learn) is will over will and mind over mind in relieving pain. That is the whole matter of mesmerism, clairvoyance, hypnotism and the like, and all can be ascribed to one and the same thing, the power of mind over mind. The influence of will-action, will-power, to prevent will-action and the mental process by the will, gains the operator the confidence of the patient. Now there is a large work written by a Frenchman, published in this country quite recently, called "Suggestive Therapeutics." Taking those words, "Suggestive Therapeutics," who would think that by mere suggestion to change the character of the disease, and you may change the action and condition? You locate the pain here and there, anywhere you please in the body. When any one complains of pain in one shoulder, you can change it by a suggestion of pain in the other. There is only a certain class that can be put under the influence. They regard about eighty per cent as susceptible to the influence of this hypnotization. Through the influence of it is remarkable and surprising what control may be exercised over pain. Now, when a patient comes into the office, if he has not confidence in you, and says "I believe he will hurt me like sixty," it does hurt him. Have you not had patients come in and say to you "You do not hurt me as much as others do?" I had a little girl of twelve years of age come to my office crying, expecting to be

almost killed. I sat right down by her and talked with her a little while and gained her confidence, stopped her crying, got her to smiling and she put herself entirely under my control so that I could do almost anything with her, extract her teeth or anything else, and she would say when I got through that it did not hurt. If I had gone at it harshly she would have said I nearly killed her.

You know how that is yourself. Suppose you go to a surgeon for a certain operation; you think he is blundering and does not know what he is doing, and before the instrument touches the cuticle you begin to feel the pain because you have not any confidence in what he is doing. Now that confidence is one of the best anæsthetics there is. I find there is more in it than any anæsthetic I have used in my practice, and I propose to discourage local anæsthetics altogether. While upon the floor I want to speak of one as harmless as any, and that is campho-phenique. It is very valuable indeed. Whether I make it the same as the pretended discoverers or manufacturers of it at St. Louis do, I do not know. Take one ounce of carbolic acid, 95 per cent, two ounces of gum camphor. The camphor after being dissolved in carbolic acid makes it non-irritant and soothing and a very excellent obtundant. It is a very valuable medicament. I can relieve pain with it I think to a certainty, and I do not know, but I think that it is just as safe as any thing we have in all our *materia medica*. It is worth trying at any rate.

DR. ROGERS: I think Dr. Ingersoll struck the key-note just now. I think that confidence has lots to do with the success of a local anæsthetic. A patient will come in and one of the first questions asked is: "Doctor, is it going to hurt?" I sometimes ask them: "Do you want me to tell you a lie?" "No." "Well, then, it is going to hurt, but I will do the best I can for you."

The patient has to be enthused, however, or else he would not let me go any further. I get their confidence, as I am going to do the best I can for them; and that is the secret of the success of that individual operation. A lady patient who was a strong Christian Scientist came into my office some time ago, and wanted a tooth extracted. She sat down and I asked: "Shall I give you anything to alleviate the pain?" She said: "I will give you the full benefit of Christian Science." I did not use an anæsthetic, but proceeded to extract the tooth. She expressed herself very joyfully after the tooth was taken out, and said it did not hurt a particle. I



found out afterwards the secret of the success of that operation. She did not tell me at the time but I found out through others afterwards that the leading light of the Christian Scientists of the town was working upon me whilst I was working upon the lady. That is, he was working on me and through this lady and myself I was operating from a Christian Science standpoint, but I did not know it; so it was a success. Oftentimes when taking out teeth they say "it did not hurt," when it did hurt, no question about it. But they compared that pain with what they expected it to be in their imagination, and it did not come up to their imagination and therefore it seemed almost painless.

DR. I. P. WILSON: I hardly know what to think about this thing of some persons saying it don't hurt a bit. I had a suggestion made to me a few weeks ago by a Christian Science lady in our town. She was a very devoted disciple of that faith. I was hardly able to be at the chair; and was suffering a great deal with my side and scarcely able to be in the office; and I said to her that I was suffering with a severe pain. "Now," she said, "if you will just deny that you have that pain, you will get rid of all of it." I said to her, "I am too much of a little George Washington to deny it; I am suffering with pain. I cannot do that." "Well," said she, "if I had it I would deny it, and keep on denying it until I got rid of it." Whether the denying got rid of the pain, or whether we can put a great deal of confidence in what they say when they say it don't hurt, is a question I cannot answer.

DR. C. J. PETERSON: I believe there is something in that which the doctor has just referred to. I read in an article in some dental journal, I forgot which one, in which the writer instances examples of Indians when tortured, tied to the stake, in his early life he had seen them tortured there would be an expression of pain pass across the Indian's face and then his features would set; and then the essayist went on to show that it did not hurt, by reason of the Indian's will power. And then the paper by Dr. Custer, of Dayton, Ohio, in which he took the ground that it was imagination, and not the will. Of course the confidence in the operator has all to do with it. I never in my practice use an anæsthetic in excavating a tooth, but try to be as careful as possible and cut just as quickly as I can. But it cannot always be said that every tooth that a local anæsthetic is used on, if the pulp dies, that that is the result of the anæsthetic. We will have to touch on

those tubuli, or terminals of the pulp a little. I recollect that centipede that Dr. Ingersoll put on the board at Iowa City when he spoke about the pulp whether it is all nerves or protoplasm in those depths, whatever the scientific term may be, there are some teeth more painful than others, and I think that we should try and get the character of that tooth; it would determine whether we should use the local anæsthetic in excavating it or not to a great degree. I know I have excavated a cavity not larger than a pin, that must have had some centipedes in it. The doctor mentioned dryness. You did not mean dryness resulting from putting on rubber-dam, but dryness caused by mechanical dehydration; is not that it, doctor? I think that is one of the most important things in lessening pain—dry thoroughly. Some times I use a little alcohol to aid dehydration. I do not think there is very much use for local anæsthetics.

DR. INGERSOLL: I had reference to hot wire applied—heated direct.

DR. JAMES: I do not know that Dr. Ingersoll mentioned another method by which the anæsthesia can be produced, that of rapid breathing. I have been experimenting a little in that recently. I believe that I have realized some benefit, or the patients have. I witnessed in Philadelphia some years ago an operation in the Pennsylvania hospital for the removal of an arm—a surgical operation—and that method was introduced. There is a little danger in the dry, hot-air process. I have tested that too. If you put the rubber-dam on the tooth and dry it with hot air for some time you will certainly crack the enamel. You take the enamel, place it under a microscope and see myriads of little cracks in it. I do not think it is safe to carry it to a great extent.

(On account of loud talking near stenographer, he was unable to catch the closing remarks of the speaker.)

DR. A. O. HUNT: I wish to tell of a circumstance that I witnessed a year ago last winter in Chicago that relates to the discussion rather than to this paper. It relates to the subject of hypnotism, as an anæsthetic and its effect in its control of the patient's sensibility to pain. Dr. Stout invited me to go to his office to witness an operation of excavating some cavities in teeth and filling them under the effect of hypnotism. Dr. Davis, of Chicago, was the operator; that is, the hypnotic operator; and it was a very interesting as well as successful case. He hypnotized the patient

and there was no sensation of pain whatever from the excavation of the cavity from the beginning of the operation until it closed ; and I stood by the side of the chair. I have heard considerable and read much about experiments made in Germany and France and the claims made by those who were investigating the subject scientifically, stating the fact that individuals were trained sometimes to treat themselves absolutely and these individuals or these subjects were most obedient people as patients, under the effect of the hypnotic influence. I did not know but what these might be subjects of that kind. I passed into the room a number of times, spoke to but could get no response in any way from the patients. There were others present besides myself who witnessed the experiments. At the university one of the professors had been experimenting in this direction not for the purpose of surgical operations, but in other ways ; and I am fully satisfied we shall yet reap a substantial benefit from the knowledge that will be obtained of the effects of hypnotism. At any rate, that case that I saw in Chicago was a complete success. And there are many minor surgical operations ; Dr. Davis himself told me of many that he could perform by the use of hypnotism that were as successful as this we were witnessing. I saw him again about a month ago in Chicago and had a long talk with him and I may be able, perhaps, before or by another meeting to report some definite cases, as he is coming out to stay with me a little time and we are going to make some experiments in that direction, and try and give you the benefit of it whatever it may be.

DR. E. L. CLARK, Dubuque. I would like to inquire what the condition of the patient's mind was at the time of this operation in Chicago?

DR. HUNT: I do not know. Simply that all the patients seemed to be in the same condition. You have seen people under the effects of mesmerism, have you not?

DR. CLARK: I have practiced it some.

DR. HUNT: I do not know the condition of the mind. You asked the condition of the patient. He simply looked like all other patients or individuals under the effect of hypnotism.

DR. E. L. CLARK: I would like to relate a little experience of my younger days. I think we have not made very great advancement in forty years in that direction. I attended a few lectures by a scientific operator (one who was called so) in 1842. I experi-



mented somewhat myself. I was practicing in a town in Western Massachusetts in 1843, and in company one evening, was requested to mesmerize some one in the room. After selecting several who refused to have me operate upon them, I selected a lady whom I had never seen before, a stranger, whom I did not think a good subject, but thought I would try. I was surprised to find that she was in a deep sleep within eight seconds from the time I commenced the operation. She was the best subject I ever saw. By-the-way, there is a great difference in individual cases. I experimented quite freely that evening in seeing what I could do with her and whether she was really conscious of what was transpiring. She seemed to know all that was in my mind. I could take her to my office at a distance and she would explain everything that was in it. I could step out of the room and put anything into my mouth and enter the door when she was across with her face to the other wall and she would tell me what was in my mouth. A few days after this the uncle of the lady sent word that he wished I would come to the house, that his niece had been suffering with her teeth for years and that she had been much better since that evening, and asked me if I would mesmerize her again. I did so. I then said to her, I think you can have your teeth extracted while you are in this condition without pain. She said: "I have several bad teeth and I would like to have you try it." I was stopping with a clergyman, and he said: "I do not believe in it; I do not believe there is anything in it whatever." I said: "I am going to extract teeth for that lady, and if you choose you may be present." I had mesmerized parties four or five times then. I took my forceps and went to the house and the clergyman accompanied me, and I said to her: "Mrs. C., I have come to extract those teeth." I examined them; they were large molar teeth and broken down almost to the gums, and I expected to have a severe operation in getting them out. She said: "All right; I have three teeth that I want drawn." "You can go to sleep," said I. She was sitting across the room perhaps eight or ten feet from me, yet she instantly closed her eyes and I took my forceps, stepped forward and extracted one of the teeth. It was a very bad one. I then brought her out of it and said to her: "Did that hurt you?" Not a muscle moved. She looked up and smiled and I opened my hand. She said: "I had no idea you had extracted the tooth; I thought you were fooling." Said I: "Do you want the other two out?"

She said "Yes." "Then go to sleep," said I, and I then extracted the other two.

DR. J. T. ABBOTT: I would like to ask a question. I did not hear the commencement of this discussion, and I would like to ask Dr. Clark if it is possible for him to teach us so that we can put our patients to sleep and extract teeth? Is it possible?

DR. CLARK: I might say to Dr. Abbott that I do not know anything about it. I was not a believer in it when I commenced. I was, in 1842, operating in Northampton, Mass. A gentleman came from Boston, I think, by the name of Bates and invited several parties to go to the American House, a hotel, to see him operate. J. K. Holand had an office near mine and was one of the company. I think he was the one who called on me and gave me the invitation to go to the American House. One thing Mr. Bates said in his explanation, and that perhaps will answer Dr. Abbott's question: "The main thing in mesmerism is to be able to concentrate your whole thought upon the subject without turning the mind; and in explanation, he said: "There is a man in prison and to-morrow he is to be executed, but he is told there is just a little slot where he can see through, and during the twenty-four hours before the execution a man will pass that opening, and if he can get sight of him he will live, he will be reprieved; if not, he dies. He will concentrate his mind right on that thing and will think of nothing else." Said he: "If a man can do that he can mesmerize if he has a good subject, but all subjects are not alike." Who are the good subjects, I do not know.

DR. L. C. INGERSOLL: This discussion has departed a little from the original. As a result, the only question is, can it be answered by the method alluded to? In regard to Dr. Davis, of Chicago, about centering the mind, he says to the patient: "Look at my two fingers; look at that; look me right in the eye; look here; look here." He commands the mind of the patient instantly. Now in regard to the patient, he must have confidence in the doctor; not only confidence in him that he is doing no harm, that all will be right, but he must also yield his will-power to almost anything he tells him to do; yield up entirely his will-power. In view of this fact, perhaps, it is not essential that a person should be weak in mind. The strongest minded men would be susceptible to it, because they would yield up their minds. Any one can resist the influence if he says "I won't be." In regard to this hospital treat-

ment in France, the report of those in charge of the hospital, is that about eighty per cent of those who go through—but those who go through are invalids and usually nervous, deranged and especially hysterical. Nearly all hysterical patients are subject to influence and nervous, and derangement of every species are the subjects ordinarily, but only about 80 per cent. Dr. Davis, in Chicago, told me that about 20 per cent of people in general are subject to the influence. Taking them as they come, there might be twenty in a hundred who could be influenced ordinarily, possibly, but it is a matter of experiment, and another thing it is a matter of education also. A patient who cannot be operated upon at the first attempt, if he consents to come the second time, that is a little indication of his belief, of his confidence and willingness to submit himself to an operation. If he should come a third time it is a little gained, and by five or six efforts the patient may be brought fully under the influence, as it is a matter of education as well as simply nerve or will-power.

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#### CHICAGO DENTAL SOCIETY.

Regular monthly meeting, June 3, 1890. Dr. C. N. Johnson, President, in the chair.

DR. H. A. COSTNER read a paper on "Root Filling,"\* which was followed by one on "Immediate Root Filling,"† by DR. EDMUND NOYES.

The two papers were discussed jointly.

DR. LOUIS OTTOFY, in opening the discussion, said: I do not think there is any operation within the range of dentistry that requires as much care to be decided, whether it should be performed or not, as that of immediate root filling. I do not stand here to advocate it or to defend it, or to claim that I generally practice it. But about the time when so much was said as to what could be done by filling roots immediately, I filled in the neighborhood of 50 or 75 cases regardless of the condition in which they were at the time they came to me; in other words, I filled every root that presented itself for filling. Out of this number there were only three cases, if I remember rightly, that gave serious trouble, or in which

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\* See page 388.    † See page 383.



the fillings had to be taken out. I do not think roots are filled at any time in this way without giving more or less trouble. The patients generally agree in claiming that an inflammation of perhaps from six to ten hours duration usually follows the filling of a root. Since then I have only practiced it occasionally in cases in which there were special reasons why the root should be filled immediately. I do not think immediate root filling pays, as a general rule, for two reasons. In the first place, many of the most prominent members of the dental profession are opposed to it. In the second place, it does not pay because the patient does not appreciate it as well as if the root had been treated a number of times; and it does not pay because it causes inflammation. I believe that for a root to be filled immediately it is absolutely essential that the canal should be perfectly cleansed. Those who are in the habit of using root filling materials without any medicament ought not to practice immediate root filling. It has been and is my practice now to always use eucalyptol and iodoform in root canals, and to use the iodoform in the condition in which we get it without any attempt being made to disguise its odor. Whether disguising its odor deteriorates from the effect of the drug or not, I am not prepared to say; but I prefer to use it in the form in which we get it. Now, if a root is thoroughly cleansed, and then filled with eucalyptol, iodoform and gutta-percha being pumped in there, in all probability some of the drug must remain there. It is claimed that the presence of the drug is detrimental to the filling. Perhaps it will take many years to determine that point. There is no doubt but what some of the drug must remain when the root has been thoroughly saturated with eucalyptol and as much iodoform pumped into it as possible, then the eucalyptol being dried out and more iodoform pumped in. I think the success of immediate root filling somewhat depends on the efficacy of the drug at the apex of the root placed there to prevent further trouble. Iodoform can be found at this point a long time after it has been introduced, whether it remains there all the time or is absorbed or passes through the apex of the root, I do not know.

When pain or bleeding occurs, it is impossible to fill a root immediately. In cases in which the pulp is dead or has been dead for years, and there is no pain or inflammation, I believe the root can be cleansed and filled at one sitting. It takes an hour to an hour and a half to do it properly, and the patient does not appreci-

ate it as well as if he were given to understand that the operation requires to be repeated at some subsequent sitting. Where there is a peridental inflammation, or the patient complains of pain at the time he presents himself, I think such a case not suitable for immediate root filling. It is my opinion, judging from what I have seen of these cases, although I do not practice in that way, that 75 per cent of the roots at the present time could be filled immediately. If eucalyptol and iodoform can be placed into the root and a gutta-percha filling put over them, and the tooth remains in good condition when thus perfectly sealed, there is no reason why the root may not just as well be filled with gutta-percha, provided some eucalyptol and iodoform remains at the apex as to fill it temporarily and fill it permanently at a second sitting. I have only practiced root filling since three years ago in cases where there were reasons sufficient to do so—as for instance, where the patient lived too far from my office, or would not be willing to go to the expense of having it treated from time to time. At the time this question was up for discussion I had in a few cases of serious inflammation, and in one or two cases I had to remove the filling. As has been said, inflammation of from six to ten hours' duration follows invariably. In those cases in which the inflammation was marked, I took special pains to have them come back. I have seen a number of them within the last two or three years, and they are in good condition.

To sum up: I would not advise immediate root-filling to be performed indiscriminately, but would select the cases carefully and do it but seldom.

DR. GEO. H. CUSHING: Some of the experiments by the essayist seem to show that gutta-percha is not the best material for a root filling, that it is somewhat porous, &c., and I was reminded of a statement made by Dr. Bødeker, of New York, who was one of the most thorough investigators in such matters. He made sections of teeth filled with dissolved gutta-percha and gave his adherence to that material as the best for the purpose, because he found in many cases it absolutely penetrated the dentinal tubuli. That was good evidence that it was a penetrating material, and experiments of my own have convinced me that it will go through canals smaller than can be discovered except with the microscope. I do not think the objection to its going through the end of the root is a serious one by any means. From my experience I have never

known any persistent trouble to arise from that. I have no question at all that every time a root is filled with dissolved gutta-percha the material goes through the foramen, if the root is perfectly filled; and sometimes if it is pumped through with great force or is pressed more tightly than it should be, it will set up irritation which will continue possibly for some days. I do not know but I have known the irritation to continue for two or three days, but it usually yields to very simple treatment. With ordinary care in stopping the packing at the moment that the patient begins to feel it being pressed through, I think there will be very little trouble of that kind.

I want to say a word further with regard to the value of gutta-percha as a general material for filling root canals, in preference to any of the metals. We all know that the larger canals can be filled successfully with metal, yet I think with very few operators can they be filled perfectly. Dr. Costner can make good fillings in these places, but I judge the majority of us would not make such nice looking ones as he has showed us to-night. That must be borne in mind. We are talking for the general practitioner. You remember at the last meeting the varieties and abnormal shapes of pulp canals were beautifully illustrated. In the cases that were shown here you saw frequently the irregular character of the canals, the little projections into them, the minute canals leading to the apical foramen, very much smaller than the one that Dr. Costner has shown here to-night. Now, in all that class of cases the gutta-percha must be preëminently the best thing we can use. I do not believe it is possible that any cements can be packed through these fine canals with certainty, and I did not understand the essayist to say that gold or tin could be effectually used there, but the gutta-percha can be used with greater certainty of its reaching the apical foramen than any other material. That is the point we want to hermetically seal, if possible. If we have that sealed we do not care so much about the remainder of the canal.

With regard to the operation of immediate root filling, I am not able to perform that operation without having more or less trouble. I have tried at times, during quite a number of years, some experiments in that line, and they have always failed, so that I abandoned the practice as unsafe. Some dentists have very great success in certain methods of practice, while others fail, owing to a lack of ability probably on the part of one and the



superior ability on the part of the other. Be that as it may, we know it to be a fact, that some individuals have remarkable success in certain operations, that others cannot equal. I am one of those that cannot meet with success in such operations. I do not deem it theoretically sound practice, I think there are strong grounds against it. There is not much room for discussion.

I want to emphasize one point which was suggested in the paper, that is, if the root is in a thoroughly aseptic condition, we may fill it. There is no question about that. Everybody knows that a root in a perfectly aseptic condition may be filled, but how do we know it is in that condition? There is the great trouble. It is better to be a little more conservative and not attempt heroic treatment; it is a safer way.

Dr. S. J. Hill, of Fargo: I am very glad to meet with this Society, to-night. I have read so much in the journals concerning immediate root filling, from time to time, that I supposed that I was away behind, that living as I am out on the prairie, I was sadly out of date. I have not practiced immediate root filling to any great extent. I have in a few instances filled them immediately, but in the majority of cases inflammation has followed, as has been mentioned by the preceding speakers. I always try to be sure that the canals are in a thoroughly aseptic condition.

As to the material used, I have for the last five or six years been in the habit of, after thoroughly cleansing the root, drying it, using a bichloride solution, again drying the root, and using eucalyptol and iodoform with a gutta-percha cone, either the eucalyptol pumped into the canal first, and the cone following, using a warm instrument for pressing it in, or the hot air syringe and warming the cone. This has seemed to furnish me the safest and the surest method of filling the canal. It has given me a great deal of satisfaction, and since it has I have had no occasion for changing it. In every case where I have filled roots immediately, the patients were far away, but the roots were not filled principally for that reason.

Dr. MULLET, of Clinton, Iowa: I cannot say anything of interest or that is new on the subject. I was greatly interested in the discussion, and I wondered why no one mentioned peroxide of hydrogen in connection with root filling. I remember a few years ago when I was in Chicago, through the kindness of a member of this society I was invited to attend a meeting. At that time some

of you were using peroxide of hydrogen and recommending it, and from that recommendation I became accustomed to its use and have continued to use it up to the present time. When one of the essayists—the first one I believe—spoke of putting fibers of cotton and leaving them in the canal for a week or more to absorb the debris or any remnant of the pulp, I thought of peroxide of hydrogen, that in many cases it would succeed much better than the fibers of cotton thrust into the root canal.

As to immediate root filling, I have had the temerity, audacity, or lack of caution, whatever you may term it, to do that in a good many cases. With four years in filling the roots of teeth I have not had to extract one. This may seem to you like boasting, but it is nevertheless a fact. In one case where abscess occurred, I was asked to go to the lady's house to extract the tooth, but when I got there a change for the better occurred and we left it in, and it is still doing good service. That was two years ago. I filled three pulpless teeth for a lady about three months ago. One of them had been filled previously. There was an abscess with a fistulæ which had existed for some six years, she told me. It was filled first with amalgam. I removed the filling, treated the abscess and filled the same day. She was at my office two or three times after that and was getting along nicely then. She said it had given her no trouble. The slight swelling which ordinarily forms in such cases was going down gradually. As Dr. Ottofy says, I think it is wise to select the cases carefully on which to practice immediate root filling. I apprehend that a great deal of our trouble about filling the roots of teeth is in the lack of thoroughness of manipulation, not whether it is possible or wise to fill it to-day or next week, but to get it absolutely free from the remnants of the dead pulp or debris it may contain should be our object, disinfecting it thoroughly and filling it thoroughly.

DR. J. G. REID: I wish to say in reference to immediate root filling, that it is in exceptional cases that I would practice that method. There are occasionally patients who do not keep their appointments regularly, and in order to get satisfaction and to get even with them I like to fill the roots of such people immediately.

I want to add further that in the use of gold and tin, as illustrated here to-night in the filling of roots, it was only a typical case in which these materials were used. It did not represent in my

opinion the majority of roots that come within our reach that can be filled in that way. I think it only represents a very small proportion of roots that can be filled as beautifully as the specimen presented to us. I do not doubt the ability of Dr. Costner as an expert in that character of manipulation, but where there is one dentist that can do that kind of work, there are a hundred who cannot use gold and tin and fill the root as represented in that case. I do not wish to try these materials. I have had sufficient success with gutta-percha, and am willing to let good enough alone. I have not found anything better, easier, or more economical than gutta-percha, hence it is my universal practice to use it for filling root canals, and my methods do not differ from those who have spoken upon that subject. I always endeavor to treat the tooth, cleanse it as well as I possibly can, and I believe the greatest success depends upon getting the root thoroughly dry, and when the gutta-percha is introduced we have a filling that is impermeable to the ingress of anything. I believe if there is any moisture in the pulp canal when filled there is a possibility that the filling will be imperfect, but otherwise I do not want anything better than gutta-percha.

DR. P. J. KESTER : I have nothing very particular to say except to criticise Dr. Ottofy's reasons for not filling roots of teeth immediately. In the first place, he says it is not popular with dentists. I do not think that a good reason, because if the operation was successful and satisfactory, it would certainly be a proper thing to do. In the second place, he says the patient does not appreciate the dentist's work, that he is not willing to pay for the time consumed in filling. I think that is another poor reason for not filling the roots of teeth immediately. Third : He says it produces pain. Now, the fact that the operation causes pain would not be a sufficient reason for not filling a root if the results of the operation were satisfactory and permanent. The reason I do not fill all roots immediately is because it is bad practice. Dr. Cushing has well said that if a root is clean it is in a condition to be filled immediately.

If Dr. Ottofy will pardon me I will criticise one more statement he made. I do not believe it is good practice to put a *persistent* antiseptic in a root. What I mean by a persistent antiseptic is such an one as iodoform, that is slowly soluble and continues to act for a long time. I fancy we might introduce an antiseptic of this kind and be misled by the apparent results.



I could not help but admire the beautiful root fillings with metal that were shown here to-night. One great trouble in the use of gutta-percha as a root filling, is that the chloro-percha is simply pumped into the roots, which is probably better than no filling at all, but a root that is filled with gutta-percha and not with a spongy mass which has been honey-combed and shrunk by the evaporation of the chloroform, will preserve a tooth indefinitely.

DR. PATTERSON, of Toronto: Mr. President and Gentlemen—I am like the rest of you on this and other questions in dentistry. We all have very peculiar ideas of it, and while I do not think it wise on my part at the present time to make any extended remarks upon the papers that have been presented, I do wish to say to you all that I am pleased to meet you here and to know you. I shall be most happy to see any or all of you at our next meeting, which I believe convenes in July, so that you may be able to see what we are doing in this line.

DR. A. W. HARLAN: It has been said that physiology is the romance of medicine, and for me the subject of treatment of abscesses and the filling of roots of teeth is the romance of dentistry. I do not care anything about making crowns, or artificial teeth, or regulating appliances—anywhere near as much as I do about the treatment of disease around the roots of teeth and the filling of them.

Now, the philosophy of root filling is what we are trying to arrive at, and I believe that is tolerably well understood. The object is to remove foreign matters from the roots of teeth, and if the substance of the interior of the tooth is infected that should be disinfected and the root filled, the end being hermetically sealed, if possible. If there be disease of the bony structures surrounding the roots of teeth, this can be operated upon surgically and be treated like any surgical wound.

I have listened with a great deal of interest to the paper of Dr. Costner, and I am very glad to see a man stand up in this Society and advocate any method that he is capable of rendering successful in practice; if Dr. Costner can fill the roots of teeth satisfactorily to himself and make the teeth comfortable and serviceable to his patients with the use of gold and tin, I say Godspeed to him in that work, but the average dental practitioner does not fill the roots of teeth satisfactorily. Lack of thoroughness from the beginning to the end, failure to remove poisonous matters, failure to dry the

roots, and failure to fill them, all combined, renders operations of that kind faulty.

Now with reference to the subject of immediate root filling. The science of economics steps in at once. From the pure aspect of economy it does not pay to fill the roots of teeth immediately, even if you look at it from any other standpoint, because if you have three people out of one hundred with failures you will spend more time in caring for these three in coming to your office, losing sleep, and interrupting you during the duties of the day than you would have if you had spread it over a longer time and used the medicaments that ought to be used in trying to disinfect the infected dentine. A great many gentlemen in thinking and talking about this subject, when they get on their feet lose sight of the fact that the living membrane surrounding the root of a tooth is liable in the course of time to be enfeebled and to absolutely disappear from the surface of the root, if the dentine adjacent to the cementum is polluted with mephitic gases; after that is disinfected and removed and the tooth rendered sweet, then filled after being properly dried, the peridental membrane will not be enfeebled except from the ordinary physical wear and tear of mastication. It takes a good many years to wear down a tooth of that kind.

There are many of you who have seen specimens of alveolar ulceration. My definition of alveolar ulceration would be this, in this connection: ulceration of the peridental membrane, not beginning at the apex of the root, but perhaps along the side somewhere, due in many instances to imperfect disinfection of dentine and imperfect root filling through the length of the root. Perhaps some of you have never noticed that very much, or if you have noticed it you passed it by with little thought. There are very many teeth that are tender to touch, little miserable teeth, bothering their possessors all the time, due to that cause in my opinion.

Professor Miller, in an article a little while ago in *The Dental Cosmos*, said that those gentlemen who thought that dentine could absorb gases, if they were afraid of that, they should fill the interior of the root with charcoal. Now, that is a foolish suggestion, it seems to me, to be made by a scientific man, because he knows those delicate canals cannot be filled with an absorbent of that kind. It would have been far better and much more instructive to the reading public for him to have said that, although it had not yet been proven positively that the dentine could be thoroughly

permeated by phosphoretted and sulphuretted hydrogen, yet an attempt should be made to render that non-poisonous and then a suitable root-filling could be introduced, because there are a lot of people who run after everything with which they can stuff into the roots of teeth. The amount of charcoal that can be put into the root of a tooth beyond the pulp chamber would be so slight that the condition I spoke of would be brought about—enfeeblement of the cementum and pericementum and a permanent lameness of the tooth. I do hope most sincerely that those who fill the roots of teeth to-morrow will put in the fillings in the best possible manner, and that if they do it with wood, they will press it so hard as to be sure that it is filled to the apex. There is no amount of discomfort so great as that experienced by a patient who has an imperfectly filled root, or one that is filled before it ought to be. Every man should be as thorough as possible, no matter if he be crowded for time. What we need is a little missionary work in this respect among the best of dentists.

DR. J. N. CROUSE: Incidents in office practice come up very often in root-filling. Not long ago a gentleman came to me who had broken off the crown of a central incisor. We decided to put on a banded crown. I opened the root and found it filled with gutta-percha, oxychloride of zinc and I think with some tin-foil. The root had been previously drilled open through the apex, the opening being just as large at one end as the other. The drill used was about as large as No. 4 shot (about No. 10 drill). Now then, this is a nice case to fill. (Laughter.) It is all well enough for you talk about pumping gutta-percha into the tooth, but what are you going to do in such cases. I will tell you what I did. After dressing it two or three weeks, applying peroxide of hydrogen, permanganate of potash and oil of cinnamon, and the tooth still remaining uncomfortable, I commenced packing the root pretty close with carbolic acid and cotton, just dampening the cotton with carbolic acid and driving it very gently with a mallet to be sure that it got just to the end. I finally got that tooth comfortable. The next thing was to fill the end before setting the crown. I took a drill and enlarged the lower part of the molar, making it a little funnel-shaped, then I took non-cohesive gold, rolling it into a tolerably tight roll about as large as the opening of a canal, and drove, with a very little gutta-percha around it, to end of root. I heated an instrument hot, so as to warm the gutta-percha, and drove it



carefully until I felt it was in place. These cases do not come along often. When I do strike one with a big opening at the end of the root, it taxes my ingenuity to fill it so that I am sure it is well filled.

There is no rule that can be laid down for these extreme cases, except good judgment thoroughly used, which will often be taxed to its utmost.

I have under my care at this time, a patient who has been in the hands of four as good dentists as there are in any city. The patient has been traveling about from place to place suffering from neuralgia and has had a great deal of work done. I have given my best energies to try to find out what the matter is. Several of the teeth have roots filled. In those that I have opened gutta-percha has been used. I found considerable moisture at the end of the root of one of these teeth and a chronic (blind) abscess without fistulas opening, but no filling.

After working on the case and getting the patient tolerably comfortable, the neuralgia appeared on the other side of the face. I removed a posterior filling from lower molar on that side and in lifting the gutta-percha from the pulp cavity, brought with it two little strings of gutta-percha which seemed to have extended to the end of two roots. Before removing what was in the other root I could pass a broach down the side of the filling to the end of the root.

Do you think such a filling impervious to gases and moisture?

When my broach went down to the end of this root, immediately the tooth I had been treating on the opposite side became so sore that I could not touch it. This simply shows what extreme reflex action will do.

Soon after getting the distal root open, pus filled the entire cavity. This description of recent cases will suffice for more that I could give, difficult it is true, where operations were performed by more than average operators.

I apprehend that in twenty years from now we will settle on a better material than gutta-percha for root filling. We have got a better one now, I think. I have been filling the roots of teeth with both gutta-percha and oxychloride of zinc, alternating them, trying to find out which gave my patients the more comfort. I always use gold around a broach to carry either material to end of root, and also carry the gold end if possible, relying on the plastic material to occupy the space where the gold does not go, excepting where

the roots are too small and then would use thread of cotton with oxychloride of zinc. I fail to see the romance of filling roots of teeth. Romance of that character does not strike me favorably. I revel in romance, but it does not come with filling roots. I am glad we are not all alike. I am glad some people like what I do not like. I take this matter of root filling too much to heart. There is no such joy about it to me. I like to see what I am doing. I feel better then, but the fact that we cannot see exactly what we have done makes the duty of root filling the most tedious, most unpleasant, and in proportion to the amount of time and labor given, to me the most unsatisfactory part of my work. I apprehend that oxychloride of zinc, if properly driven to the end of a root is one of the best things that we can use as a filling material.

With regard to the experiments of the gentleman in Philadelphia, who uses carbolized cosmoline ; I can see how a root might be wiped out and then a filling put in, and thus get all the advantage it may possess, using it in connection with other materials.

DR. A. E. BALDWIN : The subject of root filling and immediate root filling I am greatly interested in, and I have listened with a great deal of pleasure and interest to the reading of the papers. The first paper was illustrated by specimens of teeth, which were passed around, which seemed to demonstrate the better filling material for all roots. As Dr. Cushing has said, the one in which the gutta-percha was used was an exceedingly difficult one, and in all probability could not have been filled as well with gold had it been used instead of gutta-percha. But in regard to the filling material to be used, I believe it is impossible for any one dentist to say what shall be used. You have listened to-night to the remarks of a great many dentists and to the advocacy of different materials. The last speaker would advocate a material which in my hands is totally unreliable. It is probably because I do not understand how to manipulate it ; but there is no remedy as a filling material which has proven so admirable and efficient in my hands as the one which has been spoken of by several of the speakers to-night—gutta-percha.

In regard to the paper on immediate filling of roots, I must acknowledge that I was a little surprised in listening to it. There is nothing that any one could find fault with in the paper, because there was no definite statement made in it, except this : He would condemn severely the advocacy of immediate root filling in all

cases. I would like to know the name of a single dentist that has ever advocated the immediate filling of all roots of all teeth.

There have been a great many objections made in the discussion to-night of the immediate filling of roots of teeth, and without craving the pardon of the Society I will state that I firmly believe in the majority of cases in immediate root filling, and I can give you the grounds for my belief. In the first place, I have yet to see a tooth in or out of the mouth where, if the apical foramen of the root were perfectly filled or hermetically sealed, there would be trouble in that tooth subsequently. Now, the question is how to get that condition of things. Some dentists say that they cannot succeed in immediate root filling. I believe, as stated by two or three speakers, to-night, that thoroughness is of the utmost importance. The greatest care should be exercised in removing detritus. I do not believe that any dentist can take a pulp immediately upon its being devitalized, and remove it entirely, yet I perhaps should modify that statement a little by saying that possibly it can be done in certain instances. I doubt very much, however, whether it can be done in many cases. I believe that one should wait a reasonable time for the separation of the dead from the living tissue, then you can remove the pulp from the recently devitalized tooth, say after an interval of from one to two weeks you can effect a perfect removal of everything in the root canals with very little trouble and almost entire absence of pain. When the roots are cleaned antiseptically or aseptically, if you are thorough in getting out the contents so that you can properly dry the roots and get the filling material to the end of the root, hermetically sealing it, you will have no further trouble with the tooth. Understand me, I do not advocate the leaving in of any *debris* which might by the most captious be considered offensive to nature or to the tooth.

Dr. Cushing spoke of a filling material which is so perfect as to sometimes penetrate the dentinal tubuli. I think Dr. Cushing demonstrated to several of us many years ago that at least it would pass through openings so small that we were unable to detect them by the naked eye. That is one of the reasons why I have been using gutta-percha. As far as the absorption of gases from the inside of the root canal by the peridental membrane is concerned, I have yet to see such a case which is clearly to me a fact. I can see no plausible reason why, if you get your root clean and dry, you should wait and not fill it immediately.



I think, as Dr. Kester said, the reasons given by one of the preceding speakers for not filling roots immediately, were exceedingly poor ones, and they have been repeated by others in a measure for not filling roots immediately. I care very little about what other dentists do. If I can succeed in saving a tooth by doing it to-day, I shall do it, no matter whether my neighbor takes two months to do it or not. It is possible that I may not succeed in as many cases as I anticipate; it is possible my neighbor sees my failures and I see only my successes in the treatment of these roots.

I do not think I have ever had but one case where from immediate root-filling I had subsequent trouble. I have seen within the last year three teeth where roots were filled after several treatments that I recall in memory now, where I have been called to treat abscessed conditions. One of them had been treated for months and the root filled by a good dentist. I do not condemn the operator nor the operation, because oftentimes I think if we saw the patient at the time the other fellow saw it, we would condemn a great deal less than we do. Patients do not always do as dentists tell them. Some times the dentist will put in a dressing and the patient is somewhat dilatory in coming again. In some instances they never return. I have had one or two cases where patients have come to me with dressings in their teeth. I found that they were put in by other dentists. In the cases that have come under my care of immediate root-filling, they have been as successful to me as treated teeth were. We should remember that any poisonous substance, however noxious it may be, will become totally inert if thoroughly dessicated. If you get the root of a tooth thoroughly dessicated, then hermetically seal it, it is going to remain so. I have taken a tooth and filled the root at the apical foramen, and have then immersed the tooth after sealing the top opening, in water: I have also immersed teeth in alcohol filled in this way, and I have yet to find fluid or moisture on the inside. I can realize and know that the walls of a tooth are not as dry as they might be, because moisture in infinitesimal quantities will pervade any living or dead human tissue if allowed to remain in contact, but I have yet to see one case where I could find any marked degree of moisture in the root canal. Because one dentist does not fill the roots of teeth immediately, is no reason why I should follow his example. Patients will under-estimate the importance of our work by giving such erroneous reasons. I think

my patients will appreciate more fully my ability to cleanse the root at the same sitting, if I can do so without trouble, than to have them make ten visits and necessarily charge them ten times. I do not believe that any of us should treat without expense to the patient. So that I think we can epitomize the subject by stating this one thing: Each dentist should use that material which in his hands he has been the most successful with in working into the root canal, and hermetically sealing it. As to the time of filling a root, I should say that as soon as you can get it dry and clean, fill it at the first or subsequent sittings.

DR. OTTOFY: Mr. President—I wish to say a few words in reply to the strictures that have been made. It is perfectly proper and respectful that dentists should consider the opinion of their fellow practitioners and practice accordingly. I know there are practices in particular lines which may be successful; and as an instance I will state that in a number of cases which I have since had constantly under my observation, I have placed arsenic on the living pulp, covered it over with oxyphosphate, and filled the cavity with amalgam at one sitting. These were cases of exposed pulp. Such a practice would be considered by the profession as entirely improper. The fact that these cases are in good condition to-day is no reason for me to continue that kind of practice in the face of the profession's disapproval, although it proved successful in these cases.

As I said while on the floor previously, I believe that as a rule severe inflammation follows the immediate filling of roots, and if that be the case there is good reason to object to that kind of practice. That is not good practice which is injurious to the dentist's reputation and is the cause of considerable discomfort to the patient. I believe, as I have previously said, that in the majority of cases immediate root filling may be successful, but I do not believe it best to practice it to the fullest extent until the profession approves of it.

Another remark was made in regard to leaving medicaments in root canals. In all probability iodoform stands almost unique in that respect. It may be that some of the poisonous substances, such as bichloride of mercury or arsenic, if they were not detrimental to living tissue, might be left in the same way. Iodoform has been found to be penetrating, and has been known to retain its power and effect for a good many years in the root canal.

DR. H. A. COSTNER: I do not know that I have very much to add to what I have already said in my paper in closing the discussion, except to remark that in the specimens shown in the glass tubes the holes are very small, yet you can put almost anything into them, provided it is small enough. You can take a Donaldson broach, file off the barbs and push any substance into these holes. That can be done with any of these materials. But it was harder to introduce a piece of cotton there than anything else. I succeeded in getting in oxy-phosphate of zinc by placing it in the bulb and using pressure. It was surprising to see how far the material flew into the canal.

There is nothing personal about this work. I have tried it in these cases, and I have no doubt that any of you can do the same thing. In one case I extracted the tooth, took the nerves out of it; it was a tooth that I could have saved, but when you have patients who do not want to go to the expense and loss of time in having their teeth filled, you have to extract them. After I extracted the nerve, I then went to work and filled the root. Each one of these roots can be filled just as easy as I did it in the case mentioned. I went to work, put in gold and pushed it down with a fine instrument. I filled one root with tin, and the other with gutta-percha. I was just as ignorant as to how that would appear in the root as any one of you before you saw it. Any dentist can do this work with certainty of results; it is the easiest way to fill the root of a tooth.

If there is anything that has been eminently satisfactory to me for the last five years, it has been the treatment and filling of roots of teeth with gold and tin. I believe in using that material which gives me the best satisfaction. In most cases distal roots can be filled all right with either tin or gold, but in the case of a mesial root I think something else is better. There you cannot get anything into them in many cases. I have met with such instances frequently.

DR. EDMUND NOYES: It was remarked, I think by the first speaker, that if a tooth at the first sitting has antiseptic dressings placed in its pulp canals, covered by a perfectly tight filling and gives no trouble, that fact is evidence that if the tooth had been completely and permanently filled, there would have been no trouble, and that such a case is a fit one for immediate filling. I do not think that is true always, because I believe that can be done



in a great many instances, so that after three days of that kind of treatment the root-canal would be well disinfected ; whereas, if the same canal had been thoroughly cleansed and filled to the apex at the first sitting, the tissues at the apical space would have been poisoned in the process. This part of the question has not received the attention in the discussion that it deserves. It has been continually said that as soon as you get the pulp canal in a perfect condition, then you may fill the tooth, whether at the first or a subsequent sitting. Now, joined to that is the indispensable requirement that you get the pulp canal in perfect condition without poisoning the tissues beyond the apex, which I consider is the great reason for not practicing immediate root filling.

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RICHMOND, Va., July 11, 1890.

The Virginia State Dental Association will hold its twenty-first annual session in the High School Building, at Roanoke, Va., Tuesday, August 26, 1890, beginning at 9 o'clock a. m. We confidently expect this to be the largest and best meeting the association has ever held. All members of the profession are invited to attend, and will receive a cordial welcome. J. HALL MOORE, *Cor. Sec.*

The State Board of Dental Examiners will meet at the same time and place for the examination of candidates to practice dentistry in the State. All applicants must be graduates of some reputable dental college.

W. E. NORRIS, *Secretary.*

At the meeting of the North Carolina State Dental Society, the following named were elected officers of the society for 1890-1 : President, H. C. Herring; first vice-president, J. E. Hyche ; second vice-president, J. D. Harper ; secretary, C. A. Rominger ; treasurer, J. W. Hunter. The next annual meeting will be held at Durham, N. C., in May, 1891.

The next meeting of the South Carolina Dental Association will be held at Anderson, S. C., in July, 1891. At the meeting just held the following officers were elected : President, E. G. Ridgell ; first vice-president, J. T. Colvert ; second vice-president, J. R. Smith ; corresponding secretary, A. T. Peete ; recording secretary, B. Rutledge ; treasurer, G. W. Dick.

About thirty-five or forty dentists became members of the American Dental Association at the late meeting. Of this number, as a result of coming West, the association has gained as permanent members, eight from Kansas, seven from Missouri, five from Iowa, two from Nebraska, one from Colorado and one from California.

The Executive Committee of the American Dental Association will soon issue a circular letter to the profession of the United States, appealing to them to aid in all possible manner their local societies, in that way to endeavor to improve the professional status of the profession.

About 300 dentists were in attendance at the meeting of the American Dental Association in Excelsior Springs, Mo.

# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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LOUIS OTTOFY, D. D. S.

L. L. DAVIS, D. D. S.

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## SYSTEMATIC STUDY OR INVESTIGATION DURING THE FALL AND WINTER.

About this time most of the dental societies have held their meetings and adjourned, and the thinking, reading and progressive dentist is free to lay his plans for another year. Every dentist, whether a member of a dental society or not, ought to decide upon some systematic course of investigation, experiment or study, as his inclination may direct. Those who teach and whose term of labor is soon to begin have no time to lose. Those who are engaged in literary work, as a rule, have only opportunities to relax during the summer months, and merely increase their vigor in fall and winter. But the great mass of dentists, who need, not as a matter of necessity, turn one way or another from that daily routine of practice which aids so quickly to fill immature graves or leads to "retirement from practice" in the earlier portions of middle life, will find it not only profitable mentally, but physically refreshing, if they will lay their plans to pursue some investigation more or less directly bearing on dental science.

A casual perusal of almost any dental journal or of the transactions of any dental society will furnish any amount of points or clues wherefrom to begin. Decide on your course and do a certain amount of work each day and you will be astonished how much you will have accomplished by the time the dental society meetings begin next spring; and when a committee of some dental society requests you to read a paper or give a clinic, or when you are called upon to discuss a subject, you will not find it necessary to decline for want of information.

## PRELIMINARY EXAMINATIONS.

As the dental colleges will soon reopen for the winter with numerous applicants for admission to college halls, we respectfully ask the governing authorities to exercise their prerogative and fail not to reject unfit applicants for entrance into college. From conversation with recent graduates we fear that too many are entering the ranks totally unfit by previous education to become ornaments in the profession. We would suggest the advisability of employing teachers of the high schools as examiners, in order to check the too easy entrance upon professional study. There may be fewer students, but this world will not suffer if the quality be improved at the expense of quantity. No one, we presume, so well knows from actual experience the illiteracy of many dental graduates as the editor of a journal. Correspondence and the submission of papers discloses this fact better even than a short conversation. Gentlemen of the faculty, do your duty, although college revenues are curtailed and professors' salaries are reduced.

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THE FITTING OF BANDS TO ROOTS.

This purely mechanical operation is undoubtedly the most defective of any performed by the average practitioner, and may lead to serious results, if not carefully executed. The cause of this state of things may be considered two-fold. 1st. Lack of skill. 2nd. Hasty and careless methods.

The lack of skill is shown by the *tout ensemble* of the operation after the patient is dismissed, and is probably the greater of the two causes in bringing about so many failures.

The hundreds of students entering the profession every year are taught the latest methods of conserving the organs of mastication, and for supplying the place of lost members. This, at the present time, takes the form of crown and bridge-work, and, judging from our observations during the last year, we predict its speedy disrepute, unless more care is exercised in selecting proper cases, and more thorough work in completing the operations. It is only after much practice (on models, etc.) and a careful study of the whole subject matter, that any reasonable degree of skill is to be attained, and no one should attempt the operation upon a human being until such skill has been attained. The preparation of the root to receive the band causes most exquisite pain, even in the



hands of skilled operators, but, when attempted by a tyro, who can measure the unspeakable anguish of the sufferer?

The second cause of failure is unpardonable—we may condone ignorance, but neglect is criminal. We hear of experts preparing the root, and inserting the crown, inside one hour, and have witnessed the clinics of some of these skilled operators, but have yet to see a perfect operation done against time. A poorly prepared root can never receive a well-fitting band; and a root cannot be well prepared with very great haste, as hæmorrhage is one of the persistent obstructors of such a performance.

The first step in an operation of this kind, (presuming the case to be favorable) should be a careful study of the direction of the root's axis, so that in beveling the edge, the band may go squarely to position, without leaving a sharp projection of the metal beyond the dressed surface, as such an occurrence will cause an inflammation of the surrounding soft tissues, resulting in a recession of the gum, if in nothing more serious. Next, in fitting the band, draw the band a trifle smaller than the prepared root, and the result will be a perfect adaptation.

The after stages require the same amount of consideration, to produce an artistic and perfect piece of workmanship, and if all the details are conscientiously performed, the result will be happiness to both operator and patient.

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#### ONTARIO DENTAL SOCIETY.

It was the good fortune of a member of THE REVIEW's staff to attend the late meeting of the above society in Toronto, July 15-17, and the occasion will not soon be forgotten by the visitor. That the meeting was a success we feel sure will be admitted by every one present. The papers were good, most of them being short, sharp, and to the point; and the spirited nature of the discussions went to prove that the dentists of Ontario are fully alive to the very latest ideas in theory and practice. Older societies might learn something from the methods observed during this meeting. In the discussions there were no long, windy, wearisome dissertations. No member occupied the floor for the purpose of killing time, and never for one moment did the meeting drag. The allotted time was fully taken up—mostly in the consideration of scientific topics, there being little of routine business to hamper the progress.

The best of good-fellowship existed from beginning to end, and the officers were elected on the impulse of the moment, without the meeting being marred by political wire-pulling or running for office. It is doubtful if a single officer had the slightest intimation that he was to be nominated. Such a spirit as this exhibited by the society augurs well for its future success and usefulness, and we confidently look for the Ontario Dental Society to soon make a record for itself.

The Toronto dentists royally entertained the visiting members and wound up the meeting by giving them a banquet. On the whole, the occasion was a most delightful one.

The DENTAL REVIEW would have been much pleased to publish the proceedings of the society at this meeting, but out of consideration for its contemporary, the *Dominion Dental Journal*, which holds by virtue of title the best right to the proceedings, and which is only published quarterly, we vacate the field.

We propose publishing in a coming number an article dealing with the present status of dentistry in the Province, and commend a consideration of the subject to our Ontario friends.

The officers of the society for the ensuing year are as follows: President, Dr. N. Pearson, Toronto; vice-president, Dr. C. V. Snelgrove, Toronto; secretary, Dr. C. H. Bosanko, Barrie; treasurer, Dr. A. W. Spaulding, Toronto. Barrie was selected as the next place of meeting.

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## DOMESTIC CORRESPONDENCE.

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### LETTER FROM DR. HASKELL.

*To the Editor of the Dental Review:*

SIR.—There are some points in your review of my “Manual,” to which I ask the privilege of reply. While the review on the whole is a fair one, we must take exception to some of its criticisms.

The following paragraph occurs: “The first paragraph of Chapter vi. is badly written, and furnishes a fair sample of the style we are so often called upon to condone in the literary products of dentists, and which eloquently pleads for higher educational culture for those who would enter our ranks now and forevermore.” Well, we confess that our “educational culture” was not such as we could have desired, having been compelled to “begin life” at

the age of 14. However, without such advantages, to think we have been able to express ourselves in good plain English, which has been our constant endeavor. If there is choice of several words to express an idea, we select the most simple; if we can convey the idea in a sentence, we do not write a page. In this book we have written mainly for the *student*, and have studiously avoided amplifying, as so many writers are prone to do, and sometimes we think, do it to exhibit their acquaintance with the dictionary. And so in the paragraph mentioned, we wished to make clear in the fewest words the requisite qualities for a dental die. We think we know what the writer had in mind, but still believe the *idea* is better expressed as it is. The statement of the objection we make to taking of impressions in wax and then in plaster, we confess might have been improved, although we do say that "because the method has been followed for twenty years by successful prostheticians," does not prove that the simple plaster is better, and for the reasons we gave. But remember we were not writing for the old fellows, but for the young ones.

In reference to the method of attaching the clasp to the plate in the mouth, we would say that we have found after having used both methods, that the wax is preferable, because we can *see* just what we are doing, and the method is more simple.

The criticism upon the making of clasp gold, we are glad to have our attention called to, and do not see how it was overlooked in the proof, only that we meant to say *twenty dwts.*, and there being twenty as applied to the karat, it misled the eye.

With regard to the matter of not writing upon crown and bridge work, and yet introducing the work of Dr. Angle on "Irregularities," we thought that was sufficiently explained in the preface. The one comprises many methods; the other we introduced because it was such a simple *system of appliances*, covering every conceivable case of irregularities, and we thought we could do our friend Angle a favor by bringing the subject to the attention of young men in their earlier experience.

L. P. HASKELL.



REVIEWS AND ABSTRACTS.

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SUPPURATION OF THE ANTRUM OF HIGHMORE.\* By Moreau R. Brown, M. D., PROFESSOR OF LARYNGOLOGY AND RHINOLOGY AT THE CHICAGO POLYCLINIC.

The lining membrane of the antrum participates in the inflammatory process resulting from catching cold in a similar manner to that of the Eustachian tube. After the cold has passed, the inflammation and suppuration, should it have reached that stage of purulency, may disappear, and the membrane return to its former condition, minus a certain amount of its normal ability to withstand such disturbances. Repeated attacks of this nature soon lead to the chronic form of the disorder.

*Symptoms.*—Should the inflammation be acute, there will be pain and tenderness with a sense of weight and fullness over the antrum and with pressure up against the eye, hyperæmia of the ocular conjunctiva, and sensitiveness of the teeth, especially noticed on masticating. The pain is increased by stooping over, and is worse in the morning.

If the inflammation owes its origin to dental complications, the symptoms indicative of these disorders are added to the above; or if it be the nasal mucous membrane that is affected, those of the coryza are also present. Should the natural outlet of the sinus become closed, as it frequently does from swelling of its lining membrane, the pain increases and the face is more tender.

The formation of pus, which is announced by a chill, causes distension of the walls, which may produce disturbance of vision by pressing on the orbital plate, and a tumor-like projection forms over the thinnest walls. Unless surgically relieved, spontaneous evacuation takes place. If the natural opening of the antrum into the nose remains free, the pus finds a ready outlet through this channel, and the irritation caused thereby to the delicate mucous membrane may produce an obstinate turgescence of the turbinated bodies and occlusion of the nasal passage. The purulent discharge will either gradually diminish and finally, in the course of a few days, cease altogether, as is witnessed sometimes in coryza, or it may continue in diminished quantity, and all symptoms of a painful nature disappear. The latter is more apt to occur in cases

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\*Read before the Illinois State Medical Association, May 9, 1890.

from dental complications. The discharge now takes place into the nose at intervals during the day, particularly shortly after arising from bed in the morning, or on stooping over; also when lying down if the position of the head be changed, as on turning from the affected to the sound side. In this (now chronic) form of the disease, although turgescence of the turbinated bodies seldom occurs from the irritation produced by the pus, yet it has been observed to exist in a very persistent form. And that hypertrophy may thus be brought on, or an existing hypertrophy aggravated, I can bear personal witness to. I therefore believe that the hypertrophy of the middle turbinated body, and possibly the polypoid growths so often seen in connection with chronic empyema, are rather a result than a cause.

When the dental arch has been the cause of the purulency, the pus is of a very offensive odor, the opposite of what prevailed in several of the acute cases reported in my table from catching cold. Extension of the disease into the neighboring cavities, and even death, has been noted among the rarer events.

*Diagnosis.*—In acute suppuration we are so aided in the diagnosis by the history of the case, that with ordinary care the disorder can readily be recognized. In chronic empyema, a discharge which is influenced by position is observed by the patient to come from the nose. By carefully inspecting the nasal cavity we shall often find pus; it may be but a thin film on the anterior and inferior part of the middle turbinated body, or between it and the outer and inner wall. When wiped away, fresh pus can occasionally be made to appear by changing the position of the head or pressing upon the thin walls of the antrum.

Voltolini's method, as described and brought to greater perfection by Heryng, is of undoubted value. It is employed as follows: The patient is placed in a room made absolutely dark and a small Edison incandescent lamp of about four-candle power, which has been connected with a battery and fastened on the upper surface of a tongue depressor, is put in the mouth. The lips are now closed and the current of electricity turned on, so that the lamp may glow to its full intensity, whereupon the bones of the face will become beautifully illuminated, a darker shade marking the situation of the antrum. Should there be fluid or a tumor within the cavity, the fact will become apparent by total absence of the illumination, and the marked contrast with the healthy side.

The water rheostat made by McIntosh & Co., of this city, or a thirty-two-candle incandescent lamp, used in the circuit with the Edison current, has enabled me to carry on my experiments satisfactorily.

A more simple test, and one upon which full reliance can be placed, is made with the peroxide of hydrogen used as follows: Cocaine having been freely applied to the middle turbinated body and the mucous membrane of the nasal cavity until thoroughly anæsthetized and contracted, a small hypodermic syringe, with a long cannula bent within a quarter of an inch of the distal end to a right angle, is passed into the hiatus semilunaris and a solution of peroxide of hydrogen (one part to twelve parts of water) is injected into the antrum. If pus be present, it is driven out and fills the nose as a white foam. That the solution has entered the antrum will be made evident by the patient complaining of slight pain at the roots of the teeth and a sense of fullness in the cheek. I know of no test so simple, free from danger and easy of application, and yet so unfailing as this. By its means I have been enabled to diagnose empyema of the antrum where the only symptom was a slight discharge of pus in the nasal passage. In one instance where the antrum was pronounced healthy by a consulting surgeon, a subsequent operation confirmed the opinion of suppuration I had been induced to hold after the application of this test.

By the proper use of the peroxide of hydrogen one can satisfactorily differentiate between purulency of the maxillary sinus and the other hidden sources of pus which is discharged into the nose. Should the ostium maxillare be occluded and we be unable to inject the antrum, the symptoms of distension would soon set in and give undoubted evidence of that condition.

If it be deemed necessary to make an exploratory puncture, the difficulties which may arise from the plugging of the cannula, the thick bone, the abnormal conditions of the inferior turbinated body, the different positions of the antrum and the danger of breaking the instrument, will cause one to hesitate before attempting it in the inferior meatus through the nasal wall, and to give preference to perforating the facial wall above the alveolus with a small drill.

The prime object of opening the antrum is to give it free drainage, and to enable us to medicate its diseased mucous membrane. The latter of these indications is easy to accomplish, and the former only requires that the aperture be made in the most dependent



portion of the sinus ; but does drilling through the alveolus from below upward always secure this ? Anatomists agree that there are several conical processes projecting into the antrum corresponding to the first and second molar teeth, one of which is generally sacrificed in the operation. When the tooth is removed the projection remains in the floor of the antrum, and if we penetrate the thin plate forming it and enlarge the opening, as is advised by writers on the subject, the base of the elevation remains and offers an obstruction equal to its height to the complete and thorough drainage of the antrum. This objection may be considered chimerical, yet we are justified in assuming it to be one which may exist if we hold the statements and drawings of anatomists correct, and as yet we have no reason to doubt them.

This may possibly have been the cause of failure to check the formation of pus in some cases reported in medical literature.

In the treatment the operation which I prefer is that of opening the antrum in its most dependent portion, but through the upper part of, or immediately above the alveolus, as follows : The mucous membrane having been locally anæsthetized, an incision is made into it or a small piece is cut out with a tubular knife just below the gingivo-labial fold between the upper portions of the roots of the second bicuspid and first molar teeth. A drill, preferably driven by an electric motor, is entered at the point of incision into the soft tissues and directed upward, inward, and slightly backward, forming an angle of about forty-five degrees with the plane of the alveolus. A few revolutions will send the drill into the antrum at its most dependent portion. The opening thus made must be of sufficient diameter to admit of thorough cleansing and draining. A gold tube is to be well fitted so that the distal end will enter just within the antrum, and to the other end projecting beyond the mucous membrane a small strip of gold is attached and fastened to a collar around the tooth. By this method we have free drainage without the danger of foreign substances entering the antrum, and plugging the tube is not necessary. I find that cases so treated have invariably done better than those where the opening had been made through the alveolus from below, and as the operation is free from any of the objections made to the latter, I urge its trial and condemn the extraction of a sound or even of a diseased tooth for the purpose of entering the antrum.

The after-treatment consists in daily or twice a day washing the

cavity with a saturated solution of boric acid and occasionally injecting iodine, sulphate of zinc, or sub-nitrate of bismuth.

A summary of the nineteen cases which have come under my observation during the past eighteen months shows, of twenty-one suppurating antra, that nine were due to "catching cold," eight were due to dental complications, one was due to polypi of the antrum; two cause doubtful, and one, unknown cause. Fifteen were diagnosed by the assistance of peroxide of hydrogen. Three were cured, and one is now under treatment by medication through the natural nasal opening. In ten the antra were opened through the upper part of the alveolus below the gingivo-labial fold. In two a tooth was first extracted, and in four a tooth had been extracted at a prior date and the opening made through the alveolus from below. One patient refused treatment; one is now under treatment.

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DEATH FROM NITROUS OXIDE.—The first death in Canada under nitrous oxide is reported from Montreal. A man, aged twenty-four, went to the office of a dentist to have a tooth extracted, and requested to have nitrous oxide administered. After assuring himself that the patient was not suffering from heart or lung disease, the dentist administered the gas. No sooner had the tooth been extracted than the patient gave a gasp and fell over in the chair. He was placed upon the floor and artificial respiration performed, but without restoring animation. The patient was not under the influence of liquor, and five hours had elapsed since last taking food (breakfast). The purity of the nitrous oxide was tested shortly after the accident by the President of the Dental Association, Dr. Beers, who himself inhaled it from the same inhaler. The verdict of the jury was that the man died from syncope, caused by the administration of the gas, and they exonerated the dentist from blame.—*Medical Record*.

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## PRACTICAL NOTES.

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### A SIMPLE METHOD OF MAKING SPLINTS FOR FRACTURED JAWS.

BY C. N. JOHNSON.

At the recent meeting of the Ontario Dental Society Dr. J. B. Willmott, of Toronto, reported two cases of fracture which he had successfully treated by very simple means. Instead of making the splint of vulcanized rubber or any of the usual methods, he employed

the ordinary modeling compound used for taking impressions. The fractured parts were brought into position, the warm compound moulded about them, occlusion obtained with the opposite jaw. The compound was then removed, cooled, and trimmed smooth to prevent irritation. This was placed in the mouth the same as a rubber splint, and the jaws bound firmly together. In order to avoid the liability to break, the compound was strengthened by moulding it around a piece of stiff tin, cut something in the shape of of a horse-shoe to follow the curve of the jaw.

When the teeth are all in place and the jaws must be kept apart for feeding the patient, two pieces of tin may be used, one immediately below the upper teeth, the other above the lower teeth; and between the two a tin tube is soldered, leading into the mouth opposite the incisors. This admits of feeding, and makes a strong frame around which to place the compound. The simplicity of this method must at once commend it to oral surgeons, and according to Dr. Willmott it is as effective as simple. In one case where he left the splint in the mouth five weeks, the compound had not deteriorated in the least.

I have never seen this method mentioned, and am pleased to place it on record for the benefit of the profession and to the credit of Dr. Willmott.

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## MEMORANDA.

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Dr. J. S. Marshall is in Europe.

Of course, *you* will be with us in '93.

Dr. J. D. Patterson has returned from Europe.

Dr. R. B. Tuller is his name instead of Yuller. See: Look at page 482.

Drs. W. N. Morrison and H. J. McKellops, of St. Louis, are in Europe.

Southern Illinois Dental Society meets at Chester, Ill., October 21 to 24.

The Ohio State Dental Society meets in Columbus, Ohio, October 28 to 30.

The number of dentists according to the new City Directory just issued is 394.

The Newberry Library—Dental Department—is to have a first-class, complete dental library.

Interesting lantern exhibits were given by Drs. Sudduth and Hunt before the A. D. A. meeting.

The first dentist who ever practiced in Chicago, Dr. Aaron Gibbs, died a few days ago, aged 83.

The name of the editor of the *Dental Mirror*, according to the *Items of Interest*, is Rottolengui.



World's Columbian Dental Meeting, August 30th to September 11, 1893. How does that sound?

Dr. W. W. Walker, has gone to the far west for a brief trip. He was accompanied by Dr. C. S. Stockton.

A cablegram of congratulations was sent by the A. D. A., to the International Medical Congress, in session at Berlin, Germany.

The dentists in attendance at Excelsior Springs were delighted with the magnificence and beauty of the place and its environs.

Dr. C. N. Peirce, of Philadelphia, favored us with a call early in August. Likewise Dr. F. S. Whittlar, of Youngstown, Ohio.

Iodoform seems doomed from recent experiments as a dental antiseptic. Stick to the essential oils for a while yet, gentlemen.

Dr. M. L. Rhein, of New York, paid us a flying visit on his way east from attending the meeting of the American Dental Association.

The commanding presence of Dr. John C. Storey, of Texas, might have been seen on the floor of the Opera House at Excelsior Springs, Mo.

Two more dental colleges open up this winter—the Western Dental College in Kansas City, Mo., and the U. S. Dental College at Chicago.

Numerous were regrets because Drs. W. H. Morgan, of Nashville, and E. T. Darby, of Philadelphia, were detained at home by illness.

At the last report received from the bedside of Dr. W. H. Morgan, the venerable dentist and teacher, was that he was still in a critical condition.

Drs. W. C. Barrett, H. A. Birdsall, G. L. Curtis, F. W. Low, R. R. Andrews and others, have been attending the Medical Congress at Berlin.

The late President and Vice-President of the A. D. A., in their white flannel suits looked charming indeed, and would have made an elegant pair to draw to.

The first ladies admitted to membership in the American Dental Association were Mrs. Emma Eames Chase, of St. Louis, and Jessie M. Ritchey, of Des Moines, Iowa.

The selection of a place of meeting for the American Dental Association in 1891, was left with the Executive Committee. In all probability the next meeting will be held in the East.

John C. Story, from the backwoods of Texas, J. Y. Crawford, the eloquent, from Tennessee, and many other of our southern friends, were at the A. D. A. Meeting in Excelsior.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS.—President, C. R. E. Koch, of Illinois; Vice-President, L. C. Wasson, of Kansas; Secretary and Treasurer, J. H. Martindale, of Minnesota.

Judging from the action taken by Section II of the American Dental Association, we can confidently expect that the scientific inquiry into the condition of prehistoric crania will now go on.

NATIONAL ASSOCIATION OF DENTAL FACULTIES.—President, L. D. Carpenter, of Georgia; Vice-President, W. H. Eames, of Missouri; Secretary, J. D. Patterson, of Missouri; H. A. Smith, of Ohio, Treasurer.

Action has been taken by the American Dental Association looking toward the unification of the dental laws of various States of the Union; toward the establishment of a National University in Washington; also a National Dental Museum, and the appointment of dentists to the army and navy.

When the local societies are strengthened by the infusion of the best blood into the profession, they will send delegates in large numbers to the American Dental Association, whose membership ought to be not less than a thousand.

*The Dental Mirror* has appeared, dated July 1, 1890. It will be a 16-page monthly for the present. Received too late for more extended notice this month. Dr. R. Ottolengui, editor, and the Dental Publishing Company, publishers. \$1.00 per annum.

Dr. C. R. E. Koch, as Trustee of the First Regiment Illinois National Guards, enjoys the distinction of having had his name cut in the corner stone of the new building of that regiment now in course of erection on Michigan Boulevard—one of the finest drives in Chicago.

As a result of the great meeting in 1893, it is possible that an international system of notation may be adopted. The various foreign countries will be invited to formulate a plan or system, which each would recommend, and from this mass of opinions, it is quite probable that a suitable system will be evolved.

Those who operate at a window more or less exposed to sunlight, should try the Venetian blinds, which are now again coming into more general use. These blinds can be so arranged as to admit the light freely without admitting the sunlight, or so as to admit the sunlight into the room, but not directly on the patient or operator.

The Alvarenga Prize, of the College of Physicians of Philadelphia, consisting of one year's income of the bequest of the late Senor Alvarenga, of Lisbon, has been awarded to Dr. R. W. Philip, of the Victoria Dispensary for Consumption and Diseases of the Chest, Edinburgh, for his Essay on Pulmonary Tuberculosis, which will be published by the College.

Dentists throughout the United States are requested to report to Dr. J. J. R. Patrick, of Belleville, Ill., where collections of crania are located, the number in the collection, whether private or public, and by whom owned or controlled. Suitable blanks will be printed and sent to persons who are capable to examine and tabulate the condition of these crania.

Disinfektol is a new disinfectant, discovered by Dr. Bruno Loewenstein, of Rostock; the principal constituents are rosin-soaps, the combination of sodium and phenols. Soap and phenylates are united in a peculiar manner in a solution of carbonhydrates. It is employed in 2 to 7½ per cent solutions. A 5 per cent emulsion is said to equal 12½ per cent creolin emulsions, a 33 per cent muriatic acid, 5 per cent carbolic acid, and 2:1000 sublimate solution.

The venerable Dr. C. W. Spalding, of St. Louis, Mo., who has been connected with the dental profession of the West for a lifetime, is about to retire from practice and move east into the State of Rhode Island to permanently reside there. Dr. Spalding has been an interesting figure in the development of dentistry in the West, being one of the foremost in doing all that pertains to the improvement of the profession by means of its societies, colleges and schools. In whichever of

these fields he has appeared, he was always interesting, instructing and capable. As a teacher, as a lucid, plain, impressive lecturer, few are his equal and none superior. Prof. Spalding has the ability to impart to and impress on the student's mind the most difficult problems and questions relating to dental science and the collateral sciences.

We cordially wish Dr. Spalding many happy days in his declining years. He will always have a warm place in our hearts.

Lysol is the latest antiseptic, and was brought to notice by Dr. Gerlach in a paper read before the medical society at Vienna. The *Pharmac. Zeitung* describes Lysol, as a product of coal-tar, by boiling of tar oil, alkali fat, resinous acid and resin; it contains no phenol, but principally cresol. The consistency is like that of green soap; it is easily soluble in water, and possesses these advantages: 1. Lysol is superior to carbolic acid and creolin as a bactericide; 2. It is less poisonous than carbolic acid or creolin; 3. It is not a secret or proprietary preparation like creolin, and is of permanent constituency; 4. It is very much cheaper than carbolic acid or creolin. Lysol, being easily soluble in water, is suitable for general disinfection (closets, laundry, sick-rooms, etc.), as well as for all medicinal uses, aseptic or antiseptic, where toxic dangers must be avoided. For treatment of wounds a 1 per cent. solution, for internal washing  $\frac{1}{2}$  per cent. solutions are recommended.—*Notes on New Remedies.*

#### A BROKEN JAW WORTH \$1,700.

KALAMAZOO, Mich., July 17.—George Balcomb has recovered judgment for \$1,700 and costs, against the O'Dentunder Dental Company, of Detroit, for injuries inflicted by breaking his jaw while extracting a tooth.

#### LATEST QUOTATIONS.

SPRINGFIELD, Ill., Aug. 15, 1890.

The market is extremely dull. Although half of the month of August has passed, not a single new dental college has applied for papers of incorporation. To those who may have some apprehension on account of this dullness, it may be stated that this is in all probability due to warm weather and not at all to any want of activity in dental circles. Besides, the month is only half over, and hence there is still hope.

#### WHAT WOMEN ARE DOING.

There are now three female dentists in New York, all of whom are thoroughly qualified to practice the profession. Only one of them is a specialist. She is a clever and handsome young Jewess, and she has studied the work of filling teeth with a great deal of care for several years. She is amply equipped with diplomas, is business-like and industrious, and it is said that her trade is almost exclusively among men. Formerly she was employed as a typewriter in an office down-town. Her hours were from 8 to 6, and her employment uncertain. It is said that she clears \$4,000 a year now, has three months vacation, and is seldom at her chair more than five hours a day. The number of women physicians in New York is of course, very much greater than the number of female dentists. None of them, thus far, has attracted particular attention as a specialist, though the names of at least half a dozen of them are known as being general practitioners of ability.—*New York Sun.*



## MISSOURI STATE DENTAL ASSOCIATION.

Officers for 1890-91: J. F. McWilliams, President; Geo. L. Shepard, First, and W. H. Buckley, Second Vice-President; William Conrad, Corresponding, and John G. Harper, Recording Secretary; James A. Price, Treasurer. The next meeting will be held in July, 1891, at Louisiana, Mo.

## THE SOUTHERN ILLINOIS DENTAL SOCIETY

Will hold its 5th annual meeting at Chester, Ill., commencing on Tuesday, Oct. 21st, and continuing three days. Members of other dental societies and all reputable dentists are cordially invited to be present and contribute to the interest of the meeting.

L. T. PHILLIPS, Sec.

## WISCONSIN STATE DENTAL SOCIETY.

The officers elected at the twentieth annual session of the Wisconsin State Dental Society, held at Appleton, Wis., July 15 to 17 inclusive, were as follows: President, C. P. Southwell, Milwaukee; first vice-president, C. E. Edwards, Oshkosh; second vice-president, W. L. Conkey, Appleton; secretary, Claude A. Southwell, Milwaukee; treasurer, B. Douglas, Appleton. Eau Claire, Wis., was the unanimous choice for next place of meeting.

## AMERICAN DENTAL ASSOCIATION.

President, A. W. Harlan, of Illinois; first vice-president, J. D. Patterson, of Missouri; second vice-president, H. B. Noble, of the District of Columbia; secretary, Geo. H. Cushing, of Illinois; treasurer, A. H. Fuller, of Missouri; corresponding secretary, Fred. A. Levy, New Jersey. New members of the Executive Committee: L. D. Shepard, of Boston; C. N. Peirce, of Philadelphia, and H. A. Smith, of Cincinnati. Next place of meeting will be decided by the Committee of Arrangements of the Executive Committee.

## SOUTHERN DENTAL ASSOCIATION.

Officers for 1890-91: President, G. F. S. Wright, S. C.; 1st Vice-President, R. K. Luckie, Miss.; 2d Vice-President, W. H. Richards, Tenn.; 3d Vice-President, L. P. Dotterer, S. C.; Corresponding Secretary, D. R. Subblefield, Tenn., and M. C. Marshall, Arkansas, Recording Secretary; H. E. Beach, Tennessee, Treasurer; V. E. Turner and B. A. Möckenfuss members of the Executive Committee. Moorehead City was selected as the next place of meeting. Committee to confer with the American Dental Association on a World's Dental Congress, L. D. Carpenter, J. Y. Crawford, J. Taft, C. S. Stockton and W. J. Barton.

## UNION MEETING.

The Central Illinois Dental Society will meet the Western Illinois District Society in joint session at Galesburg, Ill., Tuesday, October 14, 1890, the convention to last two days, or until the programme is completed. A special feature of this meeting will be a popular lecture delivered to the citizens of Galesburg, by Dr. Luman C. Ingersoll, of Keokuk, Iowa. In addition to this an excellent programme has been prepared, and a full attendance is earnestly desired. Let all dentists residing in this district attend this grand "working meeting" of these two societies.

E. K. BLAIR, *Secretary Central Illinois Dental Society.*

WAVERLY, Ill., July 11, 1890.

## UNION DENTAL CONVENTION.

Department of Exhibits, October 28 to 31, 1890, Berkeley Hall, corner Berkeley and Tremont streets, Boston, Mass. The following fourteen societies will hold a union meeting: Maine, New Hampshire, Vermont, Massachusetts Rhode Island and Connecticut State Societies, American Academy of Dental Science, Connecticut Valley Dental Society, Harvard Odontological Society, Harvard Dental Alumni Association, Boston Dental College Alumni Association, Boston Society of Dental Improvement, Worcester Dental Society, New England Dental Society.

SIR: You will observe by the above list that we are to have the largest and most representative meeting of the dental profession ever held in this section of the country. All persons having articles, instruments or materials of use in dentistry, are cordially invited to exhibit the same. Many have already signified their intention of making a large exhibit, and if you desire space, please notify the Secretary at once, giving amount of space you can occupy well, whether floor or table, and height of same. All applications should be made before September 15. Programmes, with list of exhibitors, issued October 1.

WM. P. COOKE, D. M. D.,	} <i>Exhibit</i>
W. E. PAGE, D. M. D.	
H. S. DRAPER, D. D. S.	

} *Committee.*

Applications to be made to either of the Committee, or addressed to the Secretary.

WM. P. COOKE, D. M. D., *Secretary.*

100 Boylston street, Boston, Mass.

The following extract is from *The Doctor*, a quarterly journal of medicine and therapeutics, which is mailed free to physicians throughout the U. S.:

"Toothache.—

R. Arsenious Acid ..... 15 grains.  
 Muriate of Cocaine..... 15 grains.  
 Crystallized Menthol..... 3½ grains.  
 Glycerine ..... 2 drachms.

A pledget of cotton moistened with this and placed in the cavity of the tooth will quickly check the pain.

On another page we find the following:

"Antidote for Arsenical Poisoning.—A readily prepared antidote for acute arsenical poisoning is the following:

R. Liquor Ferri Tersulphat..... 2 ounces  
 Aquæ Destillat..... 2 ounces.

M.

R. Magnesia..... 2½ drachms.  
 Aquæ Destillat..... 8 ounces.

M. Sig.—Mix the two solutions and give a tablespoonful, diluted, every five minutes as required."

In justice to those who might employ the first prescription in the manner in which it is recommended, it might be well to publish the second immediately following the first.

THE

# DENTAL REVIEW.

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VOL. IV.

CHICAGO, SEPTEMBER 15, 1890.

No. 9.

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## ORIGINAL COMMUNICATIONS.

### DENTAL EDUCATION—IN COLLEGE AND OUT.\*

By W. J. BRADY, D. D. S., MINNEAPOLIS, MINN.

An increased attention to educational matters is one of the phases of the civilization of the nineteenth century. It extends to all the more enlightened nations, and to all classes of society. It embraces not only the fields of science, literature and the arts, but includes all callings and all trades, so that we find means and methods of education discussed in the college and on the street, in the magazines and in the newspapers, among scientists and among working men, in science, in art, in professional circles, in the schools, in religion and even in politics.

In dentistry the question of better education is one of the leading questions of the day, and in its discussion we are only in line with progress of the times. Though much has been done in the past toward securing better dental education, yet there is much to be done now and in the future to keep the standard of education up to the requirements of the day. The basis on which a dental college is or should be established is part of this educational question, and should receive its share of attention. The day of the "college for revenue only" is gone by, or at least it is "near it—very near it." From the necessarily limited number to be instructed in dental science, and from the high order of instruction required, together with the expensive equipment necessary for complete work, the highest standard of dental education can only be attained in those schools where State or other public aid supports the institution, and where the incentive is "more perfect work,"

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\* Read before the Iowa State Dental Society.



and not "the almighty dollar." The aim of the college should be "better dentists," not "more students." But the financial basis of a dental college or the honorable intentions of its faculty is not all of this college question, by any means. As a rule the college course contains entirely too much of the theoretical, and entirely too little of the practical. This first is partly due to the fact that not every college "professor" is a *teacher*, and that theory without application is a regular thing in a majority of the so-called "lectures." It is no easy thing to give students thoroughly practical knowledge by a series of lectures, and yet many professors in dental colleges essay to do this who are no better fitted for such work than the listening student is fitted to practice dentistry; in either case, neither one is prepared for the work. The principles of teaching are the same whether applied to a dental college or to a kindergarten, yet few of our professors understand the first thing concerning these principles. We have a surfeit of "professors" and a woeful lack of true teachers. If we are honest in our demand for better dental education, let us demand that our teachers are prepared to teach before they begin their work, the same as we demand that our students be prepared before they begin *their* work.

Besides better teachers, the matter of increasing the amount of the practical work in our colleges, requires two things: longer time and increased facilities.

The movement toward lengthening the term of our dental schools is already strong, and should receive the support of every man who has the welfare of dentistry at heart. Two years is too little time to acquire even a fair knowledge of dental science, and even when the years are increased to three, they should be made years of nine months each, the same as other school years. Scientific studies are studies which require time to gain, and leisure to assimilate and appropriate. Nine months work cannot be crowded into six, or even five months, and there is no reason or excuse for trying to do so, anyway. Other students take college courses of three, four, and even five years of nine months each, and are no better prepared, financially, than the average of dental students.

If a man can study four years for an A. M. degree, he certainly can afford three years for D. D. S. With this increased term there comes vastly more time for the practical in the college course, not

only from the lengthened course, but from the fact that when everything is crowded and hurried through, the practical always is sacrificed rather than the theoretical. Prof. Ding Dong Bell must give his series of lectures on the Physiological Metamorphosis of the Anatomy of the Frog, if the students never get a chance to put in over half a dozen gold fillings during the entire course. The lectures on Regional Anatomy must be taken whether or not the students learn to articulate and artistically adapt a denture to the mouth.

The lengthening of the term, together with a careful pruning of the curriculum, will more nearly balance the theoretical with the practical, and add many times to the efficiency of the graduates under the new regime.

The mere lengthening of the term will not accomplish all that is possible, without increase of facilities for an abundance of practical work. It is the history of all college clinics that the material for clinics can always be secured if the college is prepared to do the work. Sufficient room must be provided, together with enough chairs, brackets, etc.; that work can be done with comfort and convenience. The laboratory in the college usually suffers most in its equipment and management, just as it usually does in the office, and consequently prosthetic work is always a drag and a burden, slow to be accomplished, and unsatisfactory to both patient and student. Not least among the better facilities needed, is a systematic provision and handling of all material needed for work. Some of the colleges have this part well arranged, but many have it illy provided for, and much time and practical experience is lost because of the red tape (or worse) necessary to get material for work.

But chief among the "better facilities" comes competent demonstrators. The demonstrator's place is no boys' play. It is a position requiring experience, judgment, *management*, and knowledge of all dental subjects. Yet, how often—indeed, rarely otherwise—we see young graduates put in this responsible position and the most important part of the student's work left to be managed by boys, little, if any, older, either in years or in experience, than the students they attempt to instruct. Shame on the colleges that advertise that "competent demonstrators are constantly with the student to render any desired aid," and then employ a graduate of perhaps the year before as such demonstrator, and who, for the

sum of \$40 a month (or more) and the glory of seeing his name among the "Faculty" as J. Wilkinson Smith, D. D. S., Demonstrator of Operative and Mechanical Dentistry and Superintendent of Clinics, will accept the place and propagate the mistakes and half matured ideas that *he* learned from some previous demonstrator of like kind.

As a boy's playmates largely make him the kind of a youth he grows to be, so the personality and daily conduct of a demonstrator, coming in direct contact with students, has as much, or more, to do with the correct development and education of the dental student than the professors and all the words they can deliver from the lecture platform. The demonstrator should not only be a capable man, but an important member of the faculty as well. He should be the professor of either operative or prosthetic dentistry, and should be the superintendent and have entire control of the clinics of his department. He may have assistant demonstrators, but he should be the recognized head of his part of the work and be in personal charge during working hours. Such a demonstrator would add more to the actual advancement of dental education than all the high-sounding professorships that exist. Our colleges must learn this lesson and adopt measures to secure and give proper pay to such a superintendent before we can hope for much true advancement in college work above what we have at this time.

We must admit that it is not easy to get such a man, but chiefly so because he costs money, not because he does not exist. If a college has not the means to secure a proper equipment of either materials or men, then let it have the moral courage to close its windows and bar its doors, and post the notice outside,

"CLOSED FOR REPAIRS,"

and thus save itself from being a willful fraud, both upon its students and upon the cause of better education. The students that apply for admission to our colleges should be considered more thoroughly than is done before the doors are opened to them. It is a recognized principle that an educational institution has the right to require a certain preliminary knowledge from its students, that time and money may not be wasted upon the incompetent or ill-prepared. So far this has been applied to dental colleges only to the extent of requiring a simple examination, less in most cases than is necessary to admit to an ordinary high school, and even



then so loosely conducted as to be a farce. This should not be. A student should be required to prepare himself for entrance to a dental college at least as well as he should to enter the ordinary freshman year of an academy or literary college. So long, however, as schools are conducted in such a manner that the lecture fee from the student has more charm to the faculty than his character or brains, we may expect this sort of thing.

But the dental college has a perfect right to require more than a preliminary literary examination, and that is some special qualifications or faculties fitting the student to pursue the special work it teaches. The idea that a dental college must take as students everybody that passes its examinations and pays the fees should be dropped. A dental student should be required to show some special fitness for dentistry, or else should be refused admission to the college till he acquires it. Say what you will, the foundation of all practical work in dentistry is mechanical. Mechanical principles and mechanical forces, mechanics from the shops and from the road are everywhere applied and adapted in dentistry. They are intelligently (in most cases) applied, even scientifically and artistically applied, but are mechanical nevertheless. Much as has been and still is the talk of the connection of dentistry and medicine, a mechanical turn of mind is necessary to make a dentist. No one ever has succeeded or ever will practically succeed in dentistry who does not possess this faculty, and the most thorough knowledge of literature or medicine will avail but little against this fact. Students then who have not a mechanical turn prominent in their make-up should be refused, or at least taken only on trial for a short time, and if found deficient in that particular, be turned away. A real kindness is done such a student in keeping him from wasting his time and money in studying for a profession where he is bound to fail—or occupy a mediocre position—simply because he has not the special talent required for the special work. A more systematic method of development of the students mechanical abilities should be inaugurated in the schools. A well chosen course of “practice work” in the purely technical operations of dentistry can be made of great value. This technical teaching can be made to cover much of the ground in both operative and mechanical dentistry, and give the student a much clearer idea of the operation when he is called to actually perform it in practical work. Two years’ experience in this work, however, has demonstrated to

me that it is considerably limited in its application, and must be supplemented by actual operations to be of the most value. Students may have their fingers and their eyes trained to a certain extent by a course of technical work, but the training of eyes to see and hands to do must begin long before the student enters the dental college. His work there is largely an adaptation of what skill he already has to the purposes and needs of the case.

The method of giving the instruction in our dental schools is open to considerable improvement. With but few exceptions, the old lecture system is the means used to give instruction from the various chairs. The lecture system has some advantages, and in some places is about the only plan that can be successfully pursued, but in general it is only a feature of the old "crowd-'em-through" plan of making complete (?) dentists of students in ten—or even eight months. With a longer term the old crowding process is no longer necessary, and leisurely and thorough study may ensue. More time may be given with reference to text-books, which heretofore have largely been ignored chiefly because the student's time is entirely taken up with attending lectures and clinics, and the few spare moments that can be snatched must be devoted to copying a few notes in legible writing. With the series of late books, suited more or less for text-books, the recitation plan can better be pursued than has heretofore been possible, and the time will not be long until we have so many and so good text-books that the old lecture plan will practically be abandoned.

So far our paper has dealt with education within the college, but there are some features of educational work outside the college that are worthy of our attention. Our profession does not receive all its education through colleges. We must receive other education, and such education that the college never can give. We should all aim to help educate each other. The value of dental journals and dental societies in this work is so apparent that comment is unnecessary. Society work may be bettered, however, by closer organization and more frequent meetings. District societies are very valuable and should be organized whenever the number is sufficient to support them. Short courses of special lectures or special work should be carried out by these societies whenever practical, and under good organization could be made practical very often.

Courses of popular lectures in the public schools on dental physiology and dental hygiene would prove of great value, not

only in the better attention to the dental organs, but in better appreciation of dental services, and discrimination between honest services and quackery.

The same field may be covered in a manner acceptable to all through the newspapers, if we can only find some professional brethren who have enough literary taste to write a series of articles that would be free from technicalities, readable and instructive.

Personal education of our patients is something we all of us try more or less and too often without much success. But in general, the time and effort thus spent more than pays us for our pains, for appreciation of our work by our patients increases with an intelligence and knowledge of our work. Work of any kind, of which the difficulty of performing is not known, cannot well be appreciated, especially if the means of judging good work from bad work of this same kind is kept a profound secret.

As aids to this work of personal education, your attention is directed to the help that charts, photographs and various illustrative means afford. By these helps we may make even a dull mind fairly well comprehend us, and in the long run make our work easier to ourselves and better appreciated by our patients.

In conclusion, we would say that education is the lever that moves the world and that we as a profession or as individuals are factors in this work only as we further the cause of true education.

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#### ROOT FILLING.\*

By E. R. MULLETT, D. D. S., CLINTON, IOWA.

In presenting my views on this important subject, I may fail to bring to any of you anything *new*, or any method or material better than that which you already know of and use. Yet the desire and hope of helping some one (I may be the one), induced me to undertake to make plain to you the way I try to do it. I do not claim originality in this method.

I can do no better than to suppose a case and detail the way I would handle it. We will therefore take a very simple one, an upper central incisor, in such condition, that we decide to destroy the pulp and fill the root.

I have succeeded several times, of late, in destroying the pulp in the following manner:

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\* Read before the Iowa State Dental Society.



Remove the debris carefully, and uncover the pulp ; moisten the point of an excavator, dip it in the crystals of cocaine and place the cocaine on the exposed pulp. There should be just moisture enough to slowly dissolve the cocaine. In a couple of minutes place a little more of the cocaine on the pulp, and in about five minutes you can begin to pick into the pulp, causing a little blood to flow. Then with the end of the instrument touch the crystals of cocaine, and carry a little more to the pulp. Continue picking at the pulp, and the application of the cocaine until the sensitiveness is so overcome that a broach may be thrust up to the end of the root, producing little or no pain; which may be accomplished in from ten to fifteen minutes. The pulp may then be brought away entire by inserting a barbed broach to the end of the root, giving it a few turns between the thumb and finger, when on withdrawing it, the pulp will be found wound tightly on the broach. Then take a fine smooth broach, wound with a few fibers of cotton dipped in a mixture of carbolic acid, oil of cloves, cinnamon and wintergreen, about equal parts, thrust it gently up the canal, filling the canal loosely. Then reverse the motion of the broach, so as to slip the cotton off, leaving the cotton in the canal.

If the root is to be crowned, I now take a wire made of block tin, file it to such a size and shape that it will freely pass up the canal. Remove the cotton from the root, and carefully introduce the tin point, which should be so fine, that it will be thrust just through the apical foramen. If it does go through, so as to be felt by the patient, remove it and cut off a very little from the point, but leave the end rounded and smooth. Insert it again, and give it a few taps with a light mallet, then remove it and you will see by the compressed form of the end that it fills the canal at the apex.

Cut partly off about one-eighth of an inch of the wire. Now wipe the canal again with the mixture of the carbolic acid and the oils, insert the wire, with the same face to the front as before ; tap lightly with a mallet, then twist it off at the place cut partly through. Then with a smooth-pointed plugger that will pass up the canal without binding, press the tin up, burnishing it in place, so as to fill completely the upper end of the root. This effectually seals the canal. Then proceed to set the crown.

If the canal is very small, or partly stopped by nodules of secondary dentine, I use the Morey drills to secure a rapidly taper-

ing form to the upper end of the canal, being careful always not to drill entirely through. But if the tooth is to be filled, I proceed as follows: Introduce the cotton saturated with the carbolic acid and oils, as mentioned above, and as soon as the bleeding ceases, wipe the canal dry and clean with cotton-wound broaches; then with a fine broach introduce chloro-percha to fill the canal. Having previously selected a gutta-percha point of suitable size, now slowly introduce it, forcing out the surplus chloro-percha. Wipe away the chloro-percha, and with a warm instrument pack the gutta-percha point carefully into the canal. After which the cavity of decay may be filled.

Although I have described the method of filling the canal of a central incisor, which is perhaps the most simple and the most readily filled of any, yet the same method would be pursued with any other tooth in like condition as to the life of the pulp.

If I fail to thoroughly remove the pulp, with the aid of the cocaine I place on it a very small quantity of the arsenious acid paste, about one-third to one-half the bulk of an ordinary pin-head and cover it with cotton, not pressed in too tightly. I leave this in a day or two and when the patient calls repeat the application if necessary, until I can remove the pulp, which may be done from some roots with a barbed broach, and from others with a very fine hook made of piano wire. If, when the last of the pulp is removed the flow of blood is persistent, I inject peroxide of hydrogen, and work it up the canal with one of the fine hook broaches, thrusting the broach up carefully, and before withdrawing it turn it partly around, so that the hook may catch any particle of the pulp that may remain. Always be very careful in thrusting a broach up the canal not to carry with it some portion of the pulp, which by repeated thrusts of the broach is packed into the upper portion of the canal where it will defy your most persistent efforts to remove, and will subsequently give trouble, probably. The pulp may very frequently be removed entire from large and medium-sized canals with a fine barbed broach, if attempted as soon as the sensitiveness is destroyed; for then it is not weakened by decomposition, and is so strong that if you catch it on the broach you are almost certain to bring it away entire, for it being the smallest at the apex, it will be most likely to part there.

I dress the canal with the mixture of carbolic acid and the oils immediately after removing the pulp, then get the broaches wound

with cotton ready—a dozen or more—then the chloro-percha and the gutta-percha pin. The “office preparation bottle” suggested by Dr. L. C. Ingersoll, is a very convenient receptacle in which to keep the chloro-percha.

When all things are ready, thrust a broach into the canal and remove the cotton dressing. Then thrust up a broach wound with cotton, turning it around, so as to wipe all moisture from the root. Withdraw it, and take another broach and another, and continue to wipe the canal until it is dry and clean.

Now with piano wire broach very fine in suitable holder, introduce the chloro-percha, working it up the canal until it is filled, then introduce the gutta-percha point.

I keep on hand a supply of silver points finer than those of gutta-percha, for thrusting into the canals of the buccal roots of upper molars, and also into the buccal and lingual sides of the canal in the anterior root of lower molars; or wherever the canal is so very small that the gutta-percha pin cannot be introduced. I have also used gold, platinum and tin for points, for filling the canals, but I have not used points of copper, as recently recommended by Dr. Carl T. Gramm, of Keokuk, Ia.

I fill the root canal as described without regard to the kind of filling to be put in the crown cavity.

If the pulp is already dead, and there is no abscess, I prepare the cavity of decay for filling; thoroughly cleanse the root canal, and fill at once. For cleansing the canal I use peroxide of hydrogen freely. When it ceases to produce gas, I wipe it out and fill the canal with the mixture of carbolic acid and the oils, allowing it to remain while I get things ready for the filling—then wipe the canal dry and fill at once.

If the pulp is dead and there is abscess, with fistula, I usually cleanse the canal thoroughly, forcing the medicaments through it, and out through the fistula; and fill at once.

If the pulp is dead, and there is abscess without a fistula, I cleanse the canal, using peroxide of hydrogen, and if there is much discharge of pus from the abscess through the tooth, I leave the tooth unstopped for a day or two, then cleanse it again, then pack the pulp chamber loosely with cotton, dipped in the carbolic acid and oils. Repeat the treatment until there is no discharge; then fill.

When there is abscess without a fistula, I sometimes make an opening through the gum and sometimes through both gum and



alveolus, so as to be able to reach the entire diseased territory with the remedies.

By pursuing this method a cure is usually accomplished more speedily than by treating the abscess through the root only.

Having had such uniform success and freedom from alveolar abscess in connection with pulpless teeth, I am assured that this method of treating and filling the roots of teeth is a good one.

Possibly there are better ways and means, but I have such confidence in this plan that I am willing to submit samples of the work to your most careful examination. I have here eighteen teeth whose roots I have cleaned and filled with chloro-percha and gutta-percha points, and the crowns with amalgam ; mostly with copper amalgam.

I did not take very much care in filling the crowns, but filled them to complete the operation.

The four which are separate were filled while their roots were embedded in gutta-percha, but wishing to be fair, I then embedded these fourteen in modeling compound in holes bored in this piece of wood, so as in some measure to represent the conditions we meet with in the mouth, the roots being hidden from view.

If agreeable to the society, I wish the president would appoint a committee of two who will take these teeth, file away so much of the roots as is necessary to expose the pulp canals and their contents, carefully examine the same and report to the society before the final adjournment.

If such committee is appointed I request that they will return the teeth to me after they have examined them.

If in presenting these samples I seem to any of you to be egotistical, I beg your pardon and earnestly request that you bring to us samples of your ways of working that we may all learn the method which is best.

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### CAN WE UNITE WITH THE MEDICAL CALLING ?

By GEO. A. MILLS, D. D. S., New York.

This question has been brought to our notice by a circumstance that occurred at a late meeting of the New York Odontological Society: The medical gentleman in attendance used these words, viz.: "My professional friends and dentists." I am sure I am not speaking amiss when I say that no one subject is being more gravely considered by thoughtful men than that which involves the

ultimate direction for the future of our calling. Such a remark, which may have been thoughtlessly uttered, as that of the medical gentleman would make one of righteous ambition cringe as from ice water down the back.

So far, observation has proved more largely than otherwise, the fallacy of anything like an enthusiastic compatibility coming out of the assumed union of the medical and dental callings. With only a few exceptions, the movement has been of a sickly and fawning character. It does not show anything of spontaneity; more, it languishes as time goes on. I am fully convinced by murmurings plainly apparent, that a reaction has already set in and will certainly assert itself in a more mature form by the time that definite steps are matured for the holding of an International Congress in 1893. Right here it occurs to me to ask this question: Will it not be wisdom to settle so much of the future purpose of our calling as this: whether it is to be one of Union, or of Independence?

The greater importance of the work we have in hand is becoming more and more apparent from year to year. If so, then how can we most effectually demonstrate it to the medical fraternity and the world? And it is to my mind that we owe *most* to the world or public, rather than to the medical fraternity as a fractional part. My answer is, "By the immediate establishment of dental hospitals in as many of our large centers as possible."

Because of no little indirect agitation of this subject Dr. Bædecker has set a generous and noble example by offering five thousand dollars to start an institution in New York City that embraces this important movement. We speak of this matter of Dental Infirmary or Hospital from a long felt interest dating back to the formation of the Brooklyn Dental Society in 1866 of which we are duly accredited with being the originator.

It was in our thought at this time, the establishment of a Dental Infirmary or Hospital, and this society has the proud record of inaugurating it. What was known as the Brooklyn Dental Infirmary was continued for five and a half years and then ignominiously abandoned, thus losing an opportunity to Brooklyn dentists which they will hardly be likely to regain in a generation. The history of the workings of this institution would show a laudable proof of its value as a growing demonstration of what could be done by dentists in all that is embraced in advanced practice. The keenness of the disappointment felt to this day by our venerable

and devoted Dr. Atkinson is hardly appreciated by those whose fault it was that this project was abandoned. Together, we have not ceased to predict that this movement would be duplicated, and prove to be one of the most fruitful of educators of the value of our calling. And we are earnest in the belief that it is to become a fact in the near future.

It is not my purpose to open the question of recognition by the medical profession for it has no bearing of importance to us so far as the merit of what we have in hand is concerned.

Our work will force its own recognition as fast as it is legitimately demonstrated. We need only to place ourselves before the public in the form of eleemosynary institutions and they are at once objects of public opinion and interest ; moreover, every practitioner who has a part in this movement will find an increasing pride in calling the attention of his clientele to their value. What is involved in medical and surgical knowledge that is of value to us will be worthy of our best endeavor to obtain. The strength of our calling will be only in knowledge from whatever source it may come.

There should be no unworthy strife, but a purpose of intelligent emulation. The fact that we have had so much petty strife among ourselves has been because of our own want of the strength that can only come of knowledge. Our largest hinderances have been in our own ranks ; we have not acted toward each other in a manly way and we know it. In other words we have not shown ourselves a "liberal profession." We have demonstrated that which is common to youthfulness ; we are coming to a maturity in which it will become us to put away "childish things." What we do must be measured by a knowledge of right. It is no longer a question of votes, but one of virtue. There is one thing manifest to us all, the marked difference of our dental terminology ; we do not make common use of so much technicality as does the purely medical man, and I ask, do we need it ? Have we not, by a use of common English, made ourselves better understood by those we have served ? And thus done away with much mysterious charlatanship ? Dr. S. G. Perry says : We have come to recognize value in our fellows and have confidence in their judgment because of their "horse-sense."

This is true in practice, however crude the phrase may seem. We seem, in a very decided manner to be forming habits of growth



which have come to stay, hence the incompatibility of a union with medicine. Multiplied evidences could be produced to sustain the truth of our statement, but they will easily appear to many. To-day the best and most intelligent of our fellows who are affiliating with medical associates continue to talk like dentists. It is only the veneered M. D. who attempts to use a foreign language. No man among us who ties himself strictly to an "M. D." that he never earned, has proved himself anything but a superficial dentist. Not only my observations, but those of many others, lead to the belief first: educate for dental practice by distinctive dental teachings, and then if a broader medical education is secured, honored by the "M. D.," dentistry is not estimated as of secondary importance. In making this statement, I admit that I have been obliged to change my views somewhat and am free to declare it. We will doubtless see as years go on changes in the methods of dental education, but I predict that dental colleges separately and distinctively, on an independent basis, will remain a fact for many years to come; and I also think that whatever associations dental teachings may make, of affiliations the tendency will be indirectly toward independence.

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OLLA-PODRIDA.\*

By A. W. McCANDLESS, D. D. S., Davenport, Iowa.

"Certainly it is excellent discipline for an author to feel that he must say all he has to say in the fewest possible words or his reader will certainly misunderstand them. Generally, also, a downright fact may be told in a plain way, and we want downright facts."

A scientific dissertation on either microbes, amœba, cytoblasts, mesoblasts, molecules or animalculæ, would be beyond my depth, and as my father once told me, "It is a good plan for small boats to keep near the shore," you will please follow me in a little cruise in shallow water and we will leave the deep-sea sailing for such large and seaworthy vessels as Ingersoll, Sanborn, Abbott, Hardman, Wilson, Dickinson, Cochran and Hunt.

As the subject indicates, this paper will be made up of different items, some one of which may help some young brother, but yet, again, you all may know everything it contains beforehand.

One can hardly attend a dental convention without benefit to himself. Many little points are picked up in conversation with

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\* Read before the Iowa State Dental Society, May, 1890.

other dentists *between* sessions or by visits to operating rooms or laboratories; little practical things here and there that one feels oftentimes are not worthy of mention. To some of these the attention of the young men is asked.

These old fellows have been in practice so long and have kept so fully abreast of the times, it would be presumption in the writer to attempt anything on their behalf.

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Impressions of the mouth for a full or partial denture should always be taken in plaster. Where difficulties arise, as they often do in partial cases, Dr. Angles' plan is unique in its simplicity, viz.: oil the impression cup before pouring the plaster, in order to facilitate the removal of the former from the latter; then divide the outer portion of the impression into three pieces, when the whole can be easily removed and replaced in the cup. After obtaining a good impression of an upper, which must include a part of the soft palate and condyles of the jaw, that portion of the plaster indicating the location of the hard palate—unless the case in hand should present a soft, spongy membrane or tissue over the hard palate—should be trimmed to relieve pressure at that point. Knock the impression out of the cup, trim off all surplus plaster before pouring the plaster for the model.

Incase the plaster impression, after its proper preparation in a sheet of lead two and one-half inches wide and about 24-gauge, the object of this is obvious. The resulting model should be scraped to the depth of a line on that part representing the soft palate, then with a proper articulation of the teeth, satisfaction for the patient and dentist usually ensues.

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In articulating a full upper and lower set of teeth, the superior centrals should first receive attention and their proper location is determined by the articulating wax, which has previously been placed on the trial plate, which should always show the proper fullness of the mouth and the length of the lip. The cutting edges of the incisors should be on a line with the lip to obtain a natural expression. The lower incisors are next articulated properly with the upper. As the full sets come to us from the manufacturers, it is always necessary to give the lower set a crowded appearance or allow a little space between the upper teeth, in case of plain ones, this is not in the least objectionable, otherwise the articulation

of the bicuspid and molars will be faulty. Thus continue the upper and lower teeth together around the arch and a perfect articulation may be the result. Some dentists make the mistake of setting the lower teeth in position first—a mistake because the *correct* articulation of a tooth always depends on *two* opposing teeth. Especially is this true when any irregularities to produce a more easy and natural appearance are desired. Powdered soap-stone is the best coating for a plaster model. Where plain teeth are employed, the necessity of a second vulcanizing in order to avoid the undesirable mixture of the two colors of rubber is obviated by placing a piece of moistened rubber dam between the two while closing the flask. The color of the pink gum is restored by immersion in alcohol while exposed to the sun.

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The nausea caused to many persons by the introduction of the impression cup into the mouth may be overcome with a gargle of camphor-water. Should this fail a four per cent solution of cocaine painted over the surface of the tongue and palate will produce the desired result except in *very* obstinate cases. As a last resort administer nitrous oxide gas. The latter remedy suggested itself to me when the others had failed and worked charmingly on the patient who, being a man and consequently not as particular of his personal appearance as a lady would be, has never made any attempt to wear his plate, as he has not found it convenient to call for the administration of the gas whenever he wished to insert the plate in his mouth. It might be well to add he left the cast for the plate with me, and he left the office with his artificial teeth snugly ensconced in his pocket, and has never shown any inclination to return. A break in a rubber plate is best repaired by placing a film of a solution of rubber in bisulphide of carbon between the old rubber and the new.

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If you have ever been exasperated by a heavy moustache obstructing your view of the lingual aspects of the oral teeth, and who has not, while endeavoring to remove deposits of calculus, a piece of rubber dam over the upper lip and held back in the usual manner will make you happy, even though your patient does not present a very attractive appearance.

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To produce the best results, gold-foil should not come in contact with moist fingers or hands. The number or thickness



desired is obtained by folding over an ivory or bone paper knife, the gold being held on a piece of spunk or napkin. It can then be held in the pliers while strips of a proper width to suit the case can be cut. A towel or napkin for the protection of the patient's apparel may be nicely kept in place by the employment of a rubber dam holder.

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An excellent rule to follow in the employment of filling material, is to use gold in every possible case. To be sure, this does not apply to deciduous teeth, and there are other exceptions which only prove the rule. Why? The use of amalgams or other materials equally easily manipulated, encourages carelessness, whereas, a gold filling requiring more care and effort, produces the opposite effect. When a patient comes to you with the nice, easy crown fillings of gold and the approximal of amalgam perhaps in the same tooth, does such work inspire you with profound respect for the operator who performed the work? In short, is it honest? Where the patient's purse will permit it, the approximal cavities above all others should be filled with gold, for in such cavities, be they of any considerable size, the weakness of an amalgam filling is most likely to show itself.

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The rubber dam should *always* be used in connection with filling approximal cavities, regardless of the material to be used. This is the only safe course to pursue and the only one by which you can be positive you have removed all superficial decay. A good matrix is also a great aid in producing a filling of proper density, and contour space between the teeth is best secured by the use of waxed linen tape of the thickness necessary. No attempt should be made to fill the tooth permanently until ample space is obtained; there and then only can the proper contour and finish be made. Two approximal cavities in juxtaposition should never be filled with silver at one sitting, for reasons above mentioned. In polishing fillings at the cervical margin, soap the edges of your sand-paper strip or disk and avoid tearing the dam or lacerating the gum. Teague's depressed disks are a great improvement over the flat ones, especially for the cervical margins. If you once use them you will be unable to conveniently dispense with them. Dr. Teague is a dentist residing in Aiken, South Carolina, and manufactures these disks himself; by ordering from him direct, his disks may be obtained for 10 cents a hundred in lots of 10,000 or over.

Where the rubber dam is used on the posterior teeth, prevent its wrinkling and obstructing your view by using an extra rubber-dam-holder passed around the neck.

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The destruction of a pulp is accomplished in various ways. In the single-rooted teeth time and labor is saved by knocking the pulp out with a stick of orange wood or hickory. When arsenic is used, Dr. Harlan's plan is very satisfactory, viz.: apply the arsenic directly to the pulp to-day, remove the medicine to-morrow, and fill the cavity with saturated alcoholic solution of tannin; the eighth day the pulp may be removed entire.

In lateral incisors where decay has progressed near the pulp, even though the tooth has never ached, be sure you are on the safe side by removing the pulp as the thermal changes in case of a filling of large size will sooner or later cause the death of the pulp if allowed to remain. The pulp in such a case may be removed, the root filled, and the gold filling inserted at one sitting without danger of future discomfort to the patient.

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A novice in the practice of dentistry is often confused by the multiplicity and dissimilarity of ways and means for the same end. Having tried many different methods of treating and filling roots of teeth, the conclusion of the writer is reached from the experience of the men most prominent in our profession, such men as Harlan and McKellops, men who stand at the head of materia medica, therapeutics and operative dentistry respectively is, that the essential oils are the proper medicaments for offensive pulp canals, and that chloro-percha and gutta-percha points their proper filling material.

The use of the essential oils does away with all danger of the coagulation of any albuminous matter that may remain in the canals and defeating your object, which may be done by carbolic acid or bichloride of mercury.

Dr. Harlan, who has made exhaustive experiments with the essential oils in root canals, both when the decomposed contents have and have not been removed, says the essential oils combine with whatever may remain in the root to form vaporizable camphors. These oils being very slightly soluble in the fluids of the mouth will remain a number of days in the pulp cavity even though not hermetically sealed—my success with this mode of treatment

has been very gratifying. An almost indispensable adjunct in the proper preparation of root canals is a root-dryer. There are different makes of root-dryers, the principle being a copper bulb which conducts the heat along a copper wire into the root canal. Dr. Gilmer, formerly of Quincy, Ill., now of Chicago, has lately invented a very ingenious and at the same time very simple root-dryer which is heated by the electric current. This is a great improvement over the method just described, because the heat can be kept up indefinitely, which of course is not so with the other.

It was my pleasure a few days ago to see this electric root-dryer in Dr. Gilmer's office. He expects to give a clinic with it next week at Springfield, during the session of the Illinois State Dental Society. It is to be hoped this little contrivance will soon be on the market as it will surely prove a great boon to those of the profession who have the electric current in their offices.

Some objections have been urged against the method of filling roots described in this paper, on account of the shrinkage of the chloro-percha caused by the evaporation of the chloroform. Dr. McKellops' reply to this is that the evaporation of the chloroform takes place while the operation is being performed. It has been my custom of late, to make assurance doubly sure by the addition of a stick of orange wood—properly shaped of course—in the root canal.

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Observation leads me to this conclusion: No matter what material is used, every step requires thorough painstaking effort. Nothing—not even the minutest detail—must be slighted. The rubber dam should be *invariably* used. The dentists of to-day rely more than ever before on absolute thoroughness in this work, and depend less on the efficacy of the various medicaments to do that work for them.

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In small cavities where the rubber dam is not used, moisture may be excluded from the buccal and labial aspect of the teeth by the aid of a piece of muslin about two and one-half inches square folded one way twice and placed between the teeth and cheek or between the teeth and lips, as the case may be.

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Many of you have often despaired, doubtless, of removing dark stain from the teeth of some of your patients. The next time such a case confronts you, add a drop or two of aromatic sulphuric acid



to your paste of pumice and water, and continue using the soft rubber disk loaded with this mixture and the stain disappears as if by magic. Floss silk charged with this preparation is a simple yet effective means of removing stains from between the teeth.

Just here it will perhaps be proper to give you the best of a number of formulæ for a tooth powder that Dr. Darby gave our class at college :

R	Prep. Chalk.....	3 viij.
	Prep. Orris Root.....	3 iv.
	Powd. Cuttle-Fish Bone .....	
	Pulv. Sugar.....	
	Castile Soap .....	aa 3ij.
	Powd. Yellow Cinchona.....	3 j.
	Bicarb. Soda.....	3 ss.
	Cochineal.....	3 j.
	Oil of Roses.....	20 drops.

Mix.

Teague's impression material has lately been brought to our notice. It gives a very nice, smooth impression, and the zinc die may be obtained by pouring the metal direct into the impression, thus simplifying the usual procedure. Chase's combination dental plate is a step in the right direction. Dr. Haskell speaks well of it and considers it quite a step above rubber.

Some of these descriptions may be somewhat ambiguous and incomplete, but that risk has been taken to avoid a multiplicity of words and an unprofitable consumption of your time. A word in closing.

Cheap dentists are found in almost every community. It takes all kind of people to make a world, and you will find all kinds of people in every city and in almost every village or hamlet. Young dentists are confronted everywhere by the cheap man, and if the practice of the former is at first very meager, he is often tempted to employ the same means of increasing it, as seems successful with his cheap neighbor. Young man, stop a moment ; consider well before taking such a step. On the other hand, does your cheap man produce good work ? determine to excel him.

Remember you are on trial in a new community. The eyes of the public are upon you. You will be measured by the value you

put on yourself. Do you decide to do work cheaply, the public at once loses confidence in you. It says he is compelled to do this because his abilities will not command more.

Do you determine to have a fair remuneration for your labor, do not be discouraged; the time is coming when, if *you do your best, your very best*, letting nothing leave your office that you would be ashamed to have a brother dentist see, the time is coming, let me repeat, when people will place a time value on your efforts and will reward you accordingly, and your operations will command a figure that will be commensurate with your most conscientious endeavors to produce something that is substantial, perfect, durable and beautiful.

Instead of allowing the cheap dentist to discourage you, let him be an incentive, an inspiration to you to impel you to higher achievements, to nobler aims, to better deeds.

A good rule to follow in all your labors is to ask yourself this question when an operation is completed: Now suppose Dr. A. or Dr. B. or Dr. C. should see this work, will it stand the test of his inspection? Would I be ashamed to have the Doctor know that work came from my hands? To be able to answer this question satisfactorily to yourself is an achievement of which you may well be proud.

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Here's some good solid advice from Dr. Swasey.

Do not compromise your dignity by being too familiar.

Do not think your patrons come to you to be amused, for there is very little that is amusing in a well-regulated dental office.

Do not boast of your superior skill; your patients will soon discover for themselves whether you have any or not.

Do not have the only set of instruments of the kind ever manufactured, or the only panacea for any pain.

Do not imagine that every young lady who consults you is hopelessly in love with you, and dying for an acquaintance.

Do not go to church for the sake of getting practice, but for a higher and nobler object. If you must resort to this or starve, take a pew in but one church at a time.

Do not complain of being overworked and rushed with appointments when you are eagerly waiting and watching for patients, and your landlady is as eagerly waiting and watching for the pay of her board bill.

Do not imagine that you have a great reputation after a few months' practice. It takes many years to make a reputation in dentistry, and a life time to keep it.

Much might be said as to neatness in your office and in yourself, of the value of every little accessory to the comfort and convenience of your patient, but ere this you've had a surfeit of "hash."

Simply let me recite to you in closing, another axiom from my father, given me on my departure from home to take up life's labors for myself: "There's nothing succeeds like success."

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PRESIDENT'S ADDRESS.\*

BY DR. H. J. COLE, NORFOLK, NEB.

Another year has passed since the last meeting of the Nebraska State Dental Society, and it falls on me as occupant of the presidential chair, to deliver the annual address. Some one has said that these annual addresses, like the prefaces of books, might often be omitted with advantage. Certainly the gentleman must mistake, else how would I, and other great (?) men have an opportunity of telling how much we *don't* know.

Being a novice in writing presidential addresses, I have looked over quite a number to see how those things were done, and with few exceptions, they are laudatory in the main.

I know very well it is pleasant to hear good things spoken of us, but I am not sure that it is always the best.

If we are not gently reminded of our faults the tendency is to look them over, and not notice them. In other words, it is necessary to have the "hair brushed the wrong way" occasionally.

The annual meetings that this society has held since I became a member have all been good—indeed it is impossible to calculate the benefit they have been to me—not at any time taking a very active part in the discussions that have always followed the reading of papers, yet I trust that I have drunk deeply of the knowledge they contained.

And I'm not sure but that the proportion of membership to the number of practicing dentists in the State, is as great, if not greater than other States, yet I cannot see why every honest, reputable dentist in the State is not a member. Fellow practitioner, if you are here and not a member of the Nebraska State

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\* Read before the Nebraska State Dental Society, 1890.



Dental Society, why are you not? Are the qualifications of membership lower than you think they should be, then join us and help raise the standard. Are our clinics and papers, and the discussions on each tame in comparison with what you would expect of a State organization, then we certainly need you to improve us along that line.

Is the social status of our society lower than that in which you are used to moving? then we need you to help lift us up. You cannot afford to stay out of these societies. They, through you, are the educators of the people in dental lore.

It is a universal fact, established by the custom of all the professions and callings, that these periodical interminglings of the different members are of vast importance. By them we are lifted out of the ruts in which we are almost certain to fall. And if any one is so fortunate to be wiser or know more than any of his brethren, that one has a great opportunity of doing some grand missionary work.

After becoming members of the State society, then, bear in mind, we are not a society of drones, but are enlisted for work, for mutual improvement, and if you wish to be benefited thereby you must *do something*, not make the flimsy excuse that members of similar societies make in some other States when called upon by the executive committee to prepare a paper or give a clinic: "O, I can't; there are so many others that are so much more able than I am; get some of them."

Do you know, they don't believe what they are saying about themselves. If any one else should say that about them they would be so out of sorts that it would take months to heal the wound.

If asked to prepare a paper, do the very best you can; the study and research necessary for its preparation will repay an hundred fold, even though you should not advance any idea that would startle the world.

You may not be an Atkinson a Webb or a Black, but if you are worthy the name of a dentist, you can *do something*, therefore *do it*. And just in this connection there is something that has crept into some of our State Societies, and I am sorry to say has made a feeble attempt on the part of a very few, to inflict itself upon us. It is called by some "cheek," by others "free advertising."

I will call it by no name; it consists of the intentionally allowing your name to appear on the programme of the society, for a paper

or a clinic, without attempting to give anything—not even an excuse.

These very persons are the first when the programmes are out to rush to their local papers and have it announced to the world (?) that Dr. so and so has been prevailed upon by such and such society, to prepare and read a paper before that assemblage at its next annual meeting, for its edification.

I spoke a few moments ago about these annual meetings, through the different members, being the educators of the people in dental lore. I would not ignore another agency, equally as potent in the educating process as the Dental Society, and that is the Dental Journal. We could not well have one without the other—the one furnishing the papers and discussions, and the other publishing and sending to the “four corners of the earth.”

I would not say to a member of this society, read *a journal*, but would say *read journals*, many of them. Read, digest, understand what you read.

At the last meeting of the National Board of Dental Faculties, they have seen fit to add another year to their required time for graduation. To the casual observer this looks like a step toward “higher education.” Time seems to be the thing that governs our dental colleges in the “requirements for graduation,” and not quality. They still hold to that stereotyped provision, “Attendance on two or three courses of lectures, etc., etc.” Now don’t understand me as being opposed to college dental education, for I am not, but make the time two, three or five years if necessary ; only keep him there till he is qualified.

As the dental profession is asking to be recognized as one of the liberal professions, I have often thought and wondered why it is that dental colleges do not adopt the same methods for matriculation that most of our colleges of liberal arts do.

If a young man asks to be admitted to a certain class in one of the latter colleges, even though he may never have seen inside college walls, and, upon thorough and rigid examination, is found prepared to enter that class, it does not matter where or how he obtained the knowledge, he is admitted.

Why should it not be so in our dental colleges?

There are hundreds of good, reputable practitioners that are desirous of taking the necessary steps to obtain a degree ; men who have spent years in practice and study and are qualified

to practice dentistry. Yet, they are placed side by side with the awkward, over-grown boy from the farm, or the lad just graduating from the village school, and after a ten or fifteen months' course they are each given diplomas, and in the light of so-called "higher education" they are equal. Now I ask in all candor, is it justice to either one?

The plan I have suggested may not be practical, but surely something should be done to remedy these things as they now exist.

A few words in regard to our Dental Law. Some of you no doubt are aware that the Legislature three years ago, passed a law regulating the practice of dentistry in Nebraska. You might say it remained a dead letter till the last meeting of our State society, when a fund was pledged for its enforcement, and a committee of three appointed from our members to look after the same. The fund was to be paid in assessments as called for by the committee. When they had what they considered a good case they commenced their work, and at the same time made two 20 per cent assessments on pledges to prosecute the case.

How well these calls were responded to, and the result of the case have already been announced before you by the committee. Our State constitution is such that we cannot have a State Examining Board, and in view of this fact if we have a law regulating the practice of dentistry in this State, it will remain inoperative unless this society take hold of it and see that it is enforced. And this cannot be done without united action on the part of the members—nor without money. If there is a single member of this society that does not intend to pay anything toward the enforcement of this law, then in all honor to yourself and the society, don't subscribe anything.

One thing more and I am done: It probably is not necessary to enter into any arguments to show that this society should publish its proceedings in pamphlet form for distribution among the members, and for general distribution to the profession throughout the State.

It seems to me that there is no one thing that we can do that will awaken a more general interest than issuing such a publication. The cost would certainly be small compared to the benefits to be derived from it. I hope to see some action taken in that direction by the coming executive committee in conjunction with the committee on dental education. Other similar societies issue



such publication at stated periods and regard it as money well expended, and why not we?

I close by thanking this society for the honor conferred upon me in making me your president; also for the patience you have displayed at my imperfections while in the executive chair, trusting to your leniency, hoping that you will remember they were mistakes of the head and not of the heart.

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#### OPERATIVE DENTISTRY.\*

By DR. D. P. SIMS, SCHUYLER, NEBRASKA.

It should be thoroughly understood by every dentist how to discriminate in the use of filling materials.

No one material is suitable for every case. The list of filling materials seems quite complete.

Roots are filled with gold, tin, gutta-percha, cotton and creasote, cotton and cosmoline, lead, amalgam, oxychloride, oxyphosphate, beeswax and cord-wood.

After eliminating a portion of these, all those which are porous and are used as vehicles for conveying some antiseptic into the canals, which are not necessary if the preliminary steps are properly taken and the work carefully done, we have left four: gold, gutta-percha, the cements and tin, sufficient for any and every case. Success rests not in the material alone, but in the manipulation of it. While one man may be born a dentist, a dozen will have to strive hard to do what the one does with ease.

One man is a skillful worker in iron and another in wood, change their work and they are no longer skillful.

While one dentist is proficient in the use of gold, another may use some other material with greater ease. Let each fill roots with that which is easiest for him, for then he will arrive the nearest perfection, and the chances of failure through faulty manipulation will be reduced to the minimum.

At one time I incorporated with my chloro-percha solution some iodoform, with the thought that if it is not a germicide as it is not, it will at least be ahead of any odors that were then in the tooth or that might subsequently arise.

A year afterward I met the patient on the street. He asked me what I had put in the roots of his tooth. I said gutta-percha.

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\* Read before the Nebraska State Dental Society, May, 1890.

"Well," he said, "I can taste it yet."

The moral is: don't do slovenly work, then there will be no necessity for filling these canals with anything but a solid non-odorous material.

I am not an advocate of immediate root filling, for those teeth containing foul and putrescent pulps.

Let those who are, after removing all the debris apply the hot air blast. Where does that foul odor come from which so offends your olfactories that you turn your nose out of its range.

Is the tooth ready to fill in this state?

It is a law of physics that no two bodies can occupy the same space at the same time.

Continue the hot air blast till the moisture is evaporated from the dentinal tubuli, then by capillary attraction antiseptics can enter. Place in a temporary stopping and appoint another sitting for the completion of the work.

In those cases of chronic abscess with fistula of long standing, nothing is gained by treating week after week. Fill as in other cases; then if it does not heal, make a horizontal incision in the gum, and with a fissure bur amputate the apex of the root and bur out the necrosed bone. It will not heal otherwise. The apex of the root will be found to be denuded, rough and jagged, sometimes black.

Of the filling materials most of us agree that for the majority of cavities gold is the best.

There are cases in which the plastics are better. The form of gold used depends on the choice of the operator.

It should be so introduced that it makes not only a solid filling, but one perfectly adapted to the cavity; that it be impervious to air and moisture, and well polished. The bugs will not have half a chance then.

Seldom are retaining points necessary. It is a needless infliction of pain on the patient. The first pieces at the cervical margin should be of soft or semi-cohesive gold, inserted with a broad plugger-point and held in place with an explorer until two angles of the cavity are filled. It is then self-retaining. The gold should protrude beyond the margin of the cavity. In finishing this gold being soft it can be burnished over the margins, dressed smooth and a perfect joint secured. Cohesive gold may be used to complete and contour the filling. The motive in using soft gold at the

cervical margin is that being more pliable a better joint can be secured with less force than with the hard cohesive form, and without the danger of shattering the enamel border by hard malleting. For the same reason tin, or tin and gold combined is used, and not because tin is in harmony with dentine, or that there is anything in the electrical action hypothesis, and that a bacterium is killed by a thunderbolt if he approaches too near this minute battery. Soft gold preserves better than cohesive gold alone. Till something more convincing is offered I claim that it is because the mechanical work is more perfect.

A word for the electric mallet: It is patent to all that the automatic mallet striking thirty blows a minute, in order to do the same amount of work as the electric striking two or three thousand blows per minute must strike much harder, and the shock of the percussion penetrate much deeper than the electric, the blows of which are superficial. For this reason this mallet is adapted to teeth of soft texture and frail walls.

If the plugging instrument is preceded by a layer of gold, there need be no cracking and straining of the enamel walls.

The field requiring its employment is in all large contour and necessarily exposed fillings of front teeth which demand that degree of solidity which enables the most perfect finish to be given them. I shall slight amalgam because it is treacherous or I do not know how to use it. It is an "imp of darkness" frequently. It has been said that "the ideal filling is a plastic." One admitting of prompt insertion, easy adaptation, rapid hardening, impervious to the oral fluids, and by adhesion to the parietes of the cavity, makes a moisture-proof joint.

When inserted with the greatest care a marginal groove appears after a year or two around the filling. In other cases it appears bulging from the cavity; perhaps a bug was enclosed under the filling and had got his back up about something.

While placing copper amalgam in a tooth I feel that it will stay there without change. I have not noticed any wasting away of the surface. Amalgam is a special providence to many, bringing dental work within the reach of a large portion of the people. Its easy adaptation in inaccessible places is a strong point in its favor. Also in that class of cavities that extend above the gum. The upper third may be filled with it and the remainder with gold after it has hardened.



The zinc phosphate would be an ideal filling if it were more durable. To remedy this it is being combined with an alloy, and good results reported.

A few days ago I had a lady patient who was all nerves. In two inferior molars were large flat approximal cavities. She wished gold fillings, but could not tolerate the rubber dam, it causing nausea.

So sensitive were the teeth or patient perhaps that it was impossible to shape the cavities to anchor an amalgam filling. By placing a stiff mix of zinc phosphate in the cavity, then working over this a soft mix of amalgam and absorbing the excess of mercury with tin I filled them. The amalgam may be prepared first, then the phosphate, and then the two incorporated.

Of all the work the dentist is called to do, crown work as now practiced is perhaps the most satisfactory.

A tooth which so far as service and appearances go has been utterly lost, is called back to take its place among its fellows, and resume its interrupted functions. It is often easier to crown a tooth than fill it; for this reason crowns are sometimes resorted to on the slightest provocation.

It is often a vexed problem to know which way to decide. In these cases it is better to favor the natural crown, for if once cut off you have played your last trump. By filling, the usefulness of the tooth is prolonged by just as much as the final crowning is deferred. The Richmond and Logan seem to be the most popular.

The Logan with its all porcelain body is the more natural in appearance but its joint is objectionable; to make a close joint, to shape it to the root and band is much more difficult than to construct a Richmond crown. The all gold crown can be made in a shorter time than either, in the following manner, but cannot be used for front teeth. Trim the sides of the root parallel, draw a strip of platinum around the root with a pair of pliers, remove and use as a measure, cut a strip of gold of the same length and of width sufficient for height of crown, draw the ends together and solder.

Drive on the root and it will take the shape of it. With Melotte's modeling compound take an impression of the cusps of an adjoining or opposite tooth. In this pour the metal for a model. Cut a piece of gold for a cap, lay on a bar of lead, place the model on this and drive into the lead. Fill the cusps with solder and grind to fit inside the band.

With the band on the root, the gum margin may be marked and the band trimmed to correspond. A bite may be taken in wax and all placed in the articulator. The cap can then be adjusted and the proper occlusion secured, then solder the joint and polish. A great deal of time and trouble has been taken to discover a good obtundent for sensitive dentine. Sharp burs and excavators, a delicate touch, and thought for the being which is at the other end of our instrument is the best as yet known. How often, when we approach the victim with the engine he is so frightened it is a wonder his hair does not turn white. He is assured the nerve is not exposed and that it won't hurt. But when the drill begins to buzz, gets hot and smokes until for want of breath we let up. He says, "doctor, it did hurt." Of course it was only his imagination, that quality of the patient's mind that causes us so much trouble. Nine times out of ten when he has a tooth extracted he asks if he won't catch cold in his jaw. Cold in a jaw; what foolishness! I wonder who was the originator of that one idea which has caused the victims so much worry, and annoyed the dentist by having to answer such foolish questions. The dentist's profession is a most trying one taking the realities alone, without any of the vain imaginings. From the nature of his occupation he can have no rest during office hours. In constant contact with patients of disturbed physical and mental powers, there is a constant drain on his own forces. Through working all day with restless men, women, a conglomeration of nerves, and with crying children, endeavoring by force of mind over mind to control them, and standing in the shape of a cork-screw all day, what wonder that his life is finally drawn and twisted out of him, and he goes to his fathers before he has finished half his days.

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#### UNION DENTAL CONVENTION

October 28th to 31st inclusive, at Berkeley Hall, Boston, Mass. This will be the great meeting of the East this year. Do not fail to attend and bring all your office novelties with you.

## PROCEEDINGS OF SOCIETIES.

## NATIONAL ASSOCIATION OF DENTAL EXAMINERS.

The ninth annual meeting of the National Association of Dental Examiners was held at Excelsior Springs, Mo., commencing Monday, August 4, 1890.

The following State boards were represented :

*Colorado*, Dr. P. T. Smith.

*Illinois*, Dr. C. R. E. Koch.

*Iowa*, Drs. S. A. Garber, E. E. Hughes, and E. D. Brower.

*Pennsylvania*, Dr. Louis Jack.

*Maryland*, Dr. T. S. Waters.

*Kansas*, Drs. L. C. Wasson and A. M. Callaham.

*Ohio*, Drs. J. Taft and H. A. Smith.

*Minnesota*, Dr. J. H. Martindale.

During the sessions the Board of Registration in Dentistry for the State of Rhode Island and Providence Plantations, represented by Dr. Wm. P. Church, was elected to membership.

In the absence of the secretary, Dr. F. A. Levy, Dr. J. H. Martindale, of Minnesota, was elected secretary *pro tem*.

After discussion, the following resolution, offered by Dr. Jack and amended by Dr. Koch, was adopted, on motion of Dr. Taft:

*Resolved*, That this body recommends the various examining boards under no circumstances to grant temporary licenses to dental students at any period of their course of instruction, whenever their State laws will permit them so to do.

Drs. Jack, Garber, and P. T. Smith were appointed a committee to formulate the principles which this association would recommend should be incorporated in the State laws. This committee subsequently presented a report which, as amended and adopted, recommended the following principles for incorporation in laws for the regulation of dental practice or for the guidance of those framing them :

1. The creation of boards of examiners in each State.
2. The boards to be officially created by the constituted appointing power of the various States, the appointees to be selected from a number of names presented by the representative State societies ; each State society at its annual meeting placing in nomination not more than two names for each appointment to be made.



3. Recognizing five years' actual practice at the time of the passage of the law as qualifying for the continuance of practice.

4. Empowering the examining boards to examine and grant certificates to non-graduates, provided the candidates present satisfactory evidence of having had at least five calendar years of instruction.

5. These and all other examinations to be both oral and written, and candidates to be also subjected to tests of practical skill.

6. Empowering the boards to examine graduates in dentistry.

7. Prohibiting medical graduates without special qualifications practicing dentistry.

8. Requiring medical graduates to have their special qualifications determined by the same tests as other non-graduates in dentistry (see No. 5).

9. Making failure to pass the required examination in any one branch sufficient cause for refusal to grant the certificate.

10. Making failure in the practical tests in either of the two general departments of dentistry work disqualification.

11. Expressing the opinion that examinations for the special degree in dentistry should be conducted by a board of examiners established by law in each State, instead of by faculties as at present; and the belief that the power to grant degrees must at length become vested in boards created for the purpose.

12. Conferring on State boards the power to revoke, for cause, a certificate of qualification previously granted.

The secretary was directed to call the attention of the American Dental Association to the fact that a case involving the constitutionality of the law regulating the practice of dentistry in New Hampshire is now pending in the Supreme Court of the United States, and asking them to see to it that it does not go by default.

Dr. Koch, from the committee on dental colleges, reported the following schools, the diplomas of which this association recommends that the State boards indorse :

American College of Dental Surgery, Chicago, Ill.

Baltimore College of Dental Surgery, Baltimore, Md.

Boston Dental College, Boston, Mass.

Chicago College of Dental Surgery, Chicago, Ill.

College of Dentistry, Department of Medicine, University of Minnesota, Minneapolis, Minn.

Dental Department Columbian University, Washington, D. C.

Dental Department of Northwestern University, Chicago, Ill.  
(Now University Dental College.)

Dental Department of Southern Medical College, Atlanta, Ga.

Dental Department, University of Tennessee, Nashville, Tenn.

Harvard University, Dental Department, Cambridge, Mass.

Indiana Dental College, Indianapolis, Ind.

Kansas City Dental College, Kansas City, Mo.

Louisville College of Dentistry, Louisville, Ky.

Minneapolis Hospital College, Dental Department, Minneapolis, Minn. (Defunct.)

Missouri Dental College, St. Louis, Mo.

New York College of Dentistry, New York, N. Y.

Ohio College of Dental Surgery, Cincinnati, O.

Pennsylvania College of Dental Surgery, Philadelphia, Pa.

Philadelphia Dental College, Philadelphia, Pa.

School of Dentistry of Meharry Medical Department of Central Tennessee College, Nashville, Tenn.

St. Paul Medical College, Dental Department, St. Paul, Minn.  
(Defunct.)

University of California, Dental Department, San Francisco, Cal.

Northwestern College of Dental Surgery, Chicago, Ill. (The diplomas of this college are discredited after 1889.)

State University of Iowa, Dental department, Iowa City, Ia.

University of Maryland, Dental Department, Baltimore, Md.

University of Michigan, Dental Department, Ann Arbor, Mich.

University of Pennsylvania, Dental Department, Philadelphia, Pa.

Vanderbilt University, Dental Department, Nashville, Tenn.

The following officers were elected for the ensuing year : C. R. E. Roch, Chicago, Ill., president ; L. C. Wasson, Topeka, Kan., vice-president ; J. H. Martindale, Minneapolis, Minn., secretary and treasurer. The president appointed as a committee on dental colleges, Drs. Louis Jack, T. S. Waters, E. E. Hughes, W. P. Church and J. H. Martindale.

On motion, the following committee was appointed to consider the advisability of holding the meetings at some other time and place than the annual meetings of the American Dental Association, with discretionary power in the matter : Drs. J. Taft, F. A. Levy and S. A. Garber.

Adjourned to meet at the call of the president.

## NATIONAL ASSOCIATION OF DENTAL FACULTIES.

The seventh annual session of the National Association of Dental Faculties was held at Excelsior Springs, Mo., commencing Monday, August 4, 1890.

The following colleges were represented :

*Baltimore College of Dental Surgery*, M. Whilldin Foster.

*Boston Dental College*, Wm. Barker.

*Chicago College of Dental Surgery*, Truman W. Brophy.

*Kansas City Dental College*, J. D. Patterson.

*Missouri Dental College*, W. H. Eames.

*Ohio College of Dental Surgery*, H. A. Smith.

*Pennsylvania College of Dental Surgery*, C. N. Peirce.

*University of California, Dental Department*, C. L. Goddard.

*University of Iowa, Dental Department*, A. O. Hunt.

*University of Michigan, Dental Department*, J. Taft.

*University of Pennsylvania, Dental Department*, James Truman.

*Vanderbilt University, Dental Department*, D. R. Stubblefield.

*Louisville College of Dentistry*, A. Wilkes Smith.

*Indiana Dental College*, J. R. Clayton.

*Dental Department of Southern Medical College*, L. D. Carpenter.

*Dental Department of University of Tennessee*, R. B. Lees.

*University of Maryland. Dental Department*, John C. Uhler.

*Columbian University, Dental Department*, H. B. Noble.

On motion, Dr. J. D. Patterson, Kansas City, was elected secretary *pro tem*.

The following resolution, offered by Dr. Hunt, was adopted :

RESOLVED, *That in all colleges of this association students to be graduated at the expiration of two years after admission must enter the school not later than twenty days after the opening of the regular session following this meeting.*

The amendment to the constitution laid over from last year, providing for changing the name of the association to American Association of Dental Faculties, was lost.

Applications for membership laid over last year, under the rules, were taken up and the following were admitted : Royal College of Dental Surgeons of Ontario ; College of Dentistry, Department of Medicine, University of Minnesota (represented by Dr. W. X. Sudduth); American College of Dental Surgery (represented by Dr. E. P. Hazen).



The following applications for membership were laid over under the rules : Dental Department of Howard University, Washington, D. C., and College of Dentistry, University of Denver.

The resolution offered By Dr. Patterson and laid over last year under the rules was taken up, amended, and adopted as follows :

*Resolved*, That after the session of 1890-91 a diploma from a reputable medical college shall entitle its holder to enter the second course in dental colleges in this association, but he may be excused from attendance upon lectures and examinations upon the following subjects : general anatomy, chemistry, physiology, and materia medica and therapeutics.

Dr. Marshall's amendment to the constitution, providing that in all matters not in conflict with Article V. of the constitution, a majority of the colleges belonging to this association shall constitute a quorum, was taken up and adopted.

The following resolution, offered by Dr. Hunt, was adopted :

*Resolved*, That we recommend that students take two full courses in studies of a general character, such as anatomy, physiology, chemistry, general principles of surgery, and materia medica and therapeutics, and three courses of those of a special dental character.

Dr. Goddard offered the following resolution, which was adopted :

*Resolved*, That final examination may be taken at the end of the second year in three general studies.

The following, offered by Dr. Truman last year and laid over under the rules, was adopted :

*Recommended*, That for a full annual course of the lectures the minimum sum of college fees be \$100 ; that diploma fees be omitted, and an examination fee of not less than \$25 be substituted therefor and made non-returnable ; that a matriculation fee of \$5 be charged annually. Special-course fees to be \$10 for each branch taken, and \$5 matriculation fee.

The following officers were elected for the coming year : L. D. Carpenter, Atlanta, Ga., president ; W. H. Eames, St. Louis, Mo., vice-president ; J. D. Patterson, Kansas City, Mo., secretary ; H. A. Smith, Cincinnati, O., treasurer ; J. Taft, Cincinnati, O., Truman W. Brophy, Chicago, and A. O. Hunt, Iowa City, Ia., executive committee.

The following committees were appointed : James Truman, Philadelphia ; Frank Abbott, New York, and John S. Marshall, Chicago, *ad interim* committee ; J. A. Follett, Boston ; D. R. Stubblefield, Nashville, Tenn. ; A. Wilkes Smith, Richmond, Ky. ; C. L. Goddard, San Francisco, committee on schools.

Adjourned to meet on Saturday, August 1, 1891, at 10 o'clock a. m., at the place appointed for the next meeting of the American Dental Association.

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IOWA STATE DENTAL SOCIETY.

*(Continued from page 536.)*

A talk on "Light for the Operating Room," was then given by Dr. A. O. Hunt.

MR. PRESIDENT, LADIES AND GENTLEMEN: I think it has been the experience of every operator who has been in practice any length of time, that as time went on he found his eyesight failing him. I do not believe that there is any reason, or any good reason, why the eyesight of the dentist should fail any more rapidly than that of other men, whose eyes are employed in a like manner. And for a long time I have thought that there was some other reason rather than our operations specially; and I am fully satisfied that that is the case. In studying this matter carefully, I have found certain conditions that every dentist works under, no matter what his light may be, whether it is a north, south, east or west light, usually it is a diffused light and it is a reflected light from his surroundings, either from the floor or walls, or from articles of furniture that are about him. The light is reflected back into his eyes. In addition to having the light directly, perhaps, in the mouth of the patient, where of course it is necessary it should be, he has this reflected light as much from the floor and from the lower part of the wall, as from any other locality; and we have cross lights at least, where the rays of incidence cross each other from all quarters. And in this way the eye is confused and strained. The muscles of the eye become tired, just as the body becomes physically tired, from this constant and restless strain. There is no uniformity about it. You change your position of body ever so little, either turning your body slightly to the right or left makes a new struggle for the eye, or at least the eye has to accommodate itself to the new condition of things. Some few years ago I noticed that if the light were shut off from the lower edge of the window at least, all the light that came in directly through the window and in this manner to the eye, made more comfortable operating, and you could operate more hours and your eyes not become so tired. Now many of us have operating rooms where the lower part of the window is not screened at all, or at least only

partially so. Or if it is screened, it is screened by some light-colored curtain or something of light texture, and it is really of no especial advantage in this respect. I have been arranging my own operating room upon a plan with a view of making some experiments, with which I am not entirely through, but I am thoroughly satisfied that I am on the right track with them. I first put shade curtains to the window, such a shade as you will usually find in our photograph rooms—that is where the sittings are made—or about the color to have the desired effect; and lower the drop without the green shades or without the red shades.

The curtains were placed at the windows running from the bottom, so that they could be run up, and at the lower part the light is shut off entirely. There were two reasons for that: Not only to prevent the light coming directly into my eyes, but also to prevent reflection of the light from buildings.

Most all offices have windows opposite their windows and you are operating at this window when the sun strikes those windows, you get the reflected light back into your eyes and the light you desire that should come at all should be the light coming from a cloud or the sky. In the use of the microscope it has been found that a reflection from a white cloud is the strongest light and the best light that can be obtained, except a steady, intense artificial light. Now, as I say, all lights should be shut off that would be likely to come into our eyes but that reflected indirectly should never come into your own eyes, but upon the face of the patient. I found that this change was an advantage, even closing the curtain, so that I only had a little light coming in at the top of the window or at least sufficiently to come directly down upon the patient's face. Some years ago I saw a very peculiar experiment. A person had lost an article in the bottom of a well and of course the well was deep and dark and it was impossible to find it easily, and another gentleman present obtained three mirrors, and by the use of these mirrors lighted up the bottom of the well so the article could be seen distinctly, and in that way it was taken out; and in thinking of this effect I arranged some mirrors for condensing the light and controlling the light, directing it wherever I desired to have it. My operating room was arranged so that all light was shut off, except what was natural by the reflection from those mirrors. Now my light is a north light and in this light I get no direct rays of the sun. If I had an east or west light, where I was likely



to get the direct rays of the sun, I should simply cover the glass with a Japanese tissue paper, or else the glass in the lower sash might be ground glass and in the upper sash be ordinary plain glass so it would be interchangeable, so that when the sun was shining directly in, the ground glass could be used, and when it was cloudy the plain glass could be used. The direct rays of the sun should not be reflected of course, but there is a mirror—we will say now that this line here (illustrating) represents the line of the window or the window sash, and this the ceiling; the light is shut off from all the lower part of the window, we will say, up to this point. Now we have the light coming in in this form, or coming through whatever space is open between the bottom of the curtain and the top of the window. I arranged the mirror that was fastened to the casing so that it can be moved at any angle, and say, if this is the ordinary transom lifter, such as is used for transoms over the doors, that will carry the weight of the mirror, and it is attached permanently here, by immovable joints. Now this will represent—I can only give you this in sectional views—this will represent the angle of the mirror at some portion of the day when the light was right for them. On the ceiling I have a larger mirror that is hung at three points, one point in the center of the mirror. Let this represent the mirror which is hung at one point there nearest the window and at two points on this side farthest from the window, that is, the hangings are here and one there, and that is controlled by cords, ordinary strong window cords, so that you can move any one of these cords and tilt the mirror or locate it as you please to change the light. Now the chair would stand—or the patient's head, we will say—would be there; this mirror at some time in the day would stand at an angle like that, and the rays of light coming in here would be reflected there and then again in that direction.

Now, you have only the face of the patient, or the mouth of the patient lighted up. Some of the gentlemen who are here have seen the effects of this light on the patient. Your operating room is essentially darkened; that is, all the light you gain is what you get from this reflected light; all other light should be shut off; at least, all other light should be shut off so that you get no reflected light except what would be the color of the curtain, such a color that it would not be observable—too much light—neither reflect any light. Now the first day I operated by the light arranged in

this way, it seemed to me that it was dark; but after all I had no difficulty whatever in seeing all parts of the operation and in working with perfect comfort and ease and I have used it in this form now about a month. A few days ago I had some outside windows that I desired to take off and they were taken down in the morning before I came to the office, and the mirrors and curtains had been changed, and various things had been moved about my operating room, and it was a long time before I was obliged to attend to a patient. I immediately noticed that going back to the old light I could draw the curtain up, as I had used it for many days and many months, but even that light became painful to my eyes operating with it, and as soon as possible I took it back and arranged the mirrors, and now I am fully satisfied of this; that the light is strong, but it is condensed; it is concentrated and you have no other light to disturb your eyes, except that directly on the patient. But there is one improvement yet that I think I shall make, that is, to condense the light more because I find if I have to lean over the chair I get now a certain reflection from this light that comes by the head rest and strikes the floor from the opposite side of the chair and reflects back into my eyes. When I get into a position and get that reflected light from the floor it is uncomfortable and unpleasant, but at all other times it is decidedly pleasant and comfortable. But more than that I have not been obliged to use the mouth-mirror in working as much as by the other methods. The light is clear and distinct and no well defined shadows; that is, no tooth over-shadowing the other to the same extent that it does where we have this great quantity of light. Now, I am not so sure that it is because the light is better, but I may add that I think very likely it is because you have only that one light to adjust your eye to; you do not have to contend with the reflected light from pieces of furniture and from side walls etc. Now something to indicate to you the quality of the light; for instance, if when the patient opens the mouth, you can see distinctly to the walls of the pharynx and see all parts of the mouth and the pharyngeal cavity as distinctly as you can see the edge of the lips or the cutting edge of the incisors. There seems to be no difference, essentially, in the quality of the light. That is why I speak of the shadows. The shadows do not seem to be so intense; at least, I find less use for the mouth mirror and a great deal more comfort in the method of operating. And that contains all there is that is novel in it, and so

far as I know that is essentially valuable with certain modifications that might arise owing to the location. Other windows different from mine situated at a different point of the compass or different sized, or differently arranged, some having bay-windows to operate in, might require a different arrangement of the mirrors; might require different changes in various ways, but the principle is essentially the same, that is, the reflected light into a mirror and then into another and from that to the mouth of the patient; and your own ingenuity, I think under different circumstances you are placed, will indicate to you very quickly what is the most desirable. And its effect upon my own eyes I am satisfied has been remarkable. Like many others, I have found that my eyes were perhaps weakened. Because I have been obliged in the last two or three years to change my glasses, even in order to see well, but within the last month I have gone back to glasses that I used some time before and find that they work very much better, so that evidently it has been a benefit in that respect so far indicating benefit in that direction. The mirrors are plain, but I believe if the ceiling were a concave mirror, you would get a better result from it. That is what I meant when I said I was going to make some changes to condense the light, and I think by that method it can be done. I think perhaps a circular mirror large enough to take in all the light from the lower mirror, a circular and concave mirror. If I can have one made I shall do so. That would give me absolute control of the whole light. Of course, I get the whole size of the reflection of that mirror in this region somewhere.

In a south light you would have to shade your light where it came from the window—that is soften it by Japanese paper. As I have thought myself of windows, for instance, this pair of windows are very nearly the same size; the one set can be glazed with ground glass and the other set with plain glass, so it may be interchangeable. If the rays run up the ground glass would be used.

The patients do not complain specially, any more than patients will sometimes—some patients, not all—very few will complain of the light being strong. That is all. Otherwise there is no complaint of it.

I will mention, by the way, a matter that is a little amusing and perhaps interesting: Speaking a while ago on the discussion of local anæsthetics, I do not know but I shall class this mirror finally as one of the anæsthetic agents. It has certainly had that effect



with some patients. I will tell you a little incident and then you will see the point in it: I was filling some teeth for a lady whose teeth are as sensitive as any, probably; at any rate she would always complain more or less about them when I had operated for her before, and she sat nearly all the morning looking up at that ceiling mirror. It was turned at an angle in such a way that people coming up street can be seen for half a block and they are all walking on their heads, and she said once or twice, "I did not know that road was so fashionable as it is this year; all the ladies seem to have on riding dresses." I observed that it was a matter of interest to her watching the reflection of the people walking along in the street. Anyway, she got along much better than ever before, and when I got through she was not so tired, and I began to watch it more, and I found the majority of people would sit in the chair and watch the movements of people in that mirror with a great deal of satisfaction, and unless the pain was absolute did not pay very much attention to what I was doing. Of course, when they felt the pain they would give some evidence of it, but a great many things we do in working about a cavity produces no pain, although the patient is prepared for every movement, expecting pain. But I am fully satisfied that the mirror rather engages their minds most of the time, while it is beneficial as a light.

#### DISCUSSION.

DR. L. K. FULLERTON, Waterloo: I will say I have had the pleasure of seeing this light and the pleasureable effect of it. We seem to get the effect of mirror light from the ceiling that we get in the cavity when we place the mirror in the mouth, and as the essayist says, change the patient's head around so as to get it in the continuous light you have in the chair, and you get a light that is fully as strong in any portion of the mouth, as we direct the mirror into the mouth and reflect the light back into the cavity we wish to examine; and it seems to me it is a help to us, besides the great saving it gives to our eyes, although, as he says, the operating room seems very dark and lonesome and perhaps seems disagreeable to the patient at first, but I cannot see any reason why it is not a great benefit to us. You can almost see through in some portion of the lips where they are extended or stretched out; the light will reflect so strongly that it will give red rays there in those portions.

DR. T. L. JAMES: I have seen Dr. Hunt's arrangements. While perhaps not yet perfect, by any means, I can vouch for the authenticity of his statements with reference to its being superior to that method of working by receiving the light through the windows, as we have heretofore made use of it. His statements with reference to blinding a portion of the windows from below is also true. I have had occasion to make use of blinds partially covering the windows. When I first commenced that practice I was on the ground floor; a good many children and others were peeping through the windows; the window was low and I concluded I would put a blind up in that way, and I noticed very readily the improvement with respect to the light, that it did not affect my eyes so unfavorably or tire them nearly so much. With reference to the formation of the mirror, of which he speaks, being concave, I could not say that that would be any special improvement, because it would be very difficult to get a mirror sufficiently large and yet have it accurate, but you can have a plain mirror made very nearly accurate; if the mirror is concave as much as would be necessary in those cases, there would be apt to be some little warps that would make serious deflections in the rays of the light. It occurs to me that he has suggested in my presence the use of a hood instead, in the shape of a funnel, which placed against or in connection with plain glass, I believe, would be superior to the concave glass.

DR. I. P. WILSON: I am very much interested in this subject. I have had some experience, although I have not made experiments, I removed one or two that came in the line that has been represented here. When I had my operating room arranged a few years ago, in order to have plenty of light I had a large window in front of my chair and then I had another one put in at the left of my chair; one in front and one to the left, so as to have plenty of light. I very soon learned that this cross light was painful to my eyes and I had to have shutters put on and that window entirely closed, I experienced the satisfactory results of the change at once. And then again, this large window in front of me at any time during the winter in one of those very cold days a few years ago, when the wind got in every crack and crevice, I felt the wind was coming in at the lower part of the window and I took a large curtain I had there and placed it over the lower part of the window to keep the wind out, and to my astonishment I had the best light I ever had,

and my eyes were at perfect rest ; when before I had been troubled a great deal with a tired vision, so that those two things I have noticed in my own practice and derived great benefit from making those changes.

Now, there is one other thing that I think we should consider from a hygienic stand-point ; a matter that was brought, I think, before the American Dental Association a good many years ago by some eastern man where he made this statement, that his health had at one time entirely failed him and he had quit the practice of dentistry for sometime ; his health was restored finally after roughing it awhile and he went back to business and his health failed again, he gave up again, and finally went back to business the third time and that time happened to get a room with either a south or west light, I have forgotten which, and took the room with a great deal of reluctance, because he could not get any other room, had to take a sun-bath every day or stand in quite a strong light, and he related four changes that he had made ; he had given up his practice twice for a long time because of the north exposure, where either the west or south exposure had always made his health poor, on the same principle that you take a plant and put it in the back part of your room you will see the plant will reach out towards the light—needs the light, needs it as much as vegetation needs it. Since that time I have given special attention to that one thing, having a good strong light for my own personal benefit. From a physical stand-point, and I do not look as though my health had failed because of light, I find myself every day toward the close standing very nearly in the full light of the sun for about an hour, so that the sun strikes me and does not strike the patient. I am satisfied a benefit is derived from that fact. We are shut off from the light ourselves too much. Now, whether these changes that Dr. Hunt has so very interestingly suggested to us will have a good effect upon our health, I am not prepared to say. I do not like the idea of a dark room ; I do not like having my eyes put out at last. Those points are all of deep interest to us as a profession, and should be looked into more than they have been heretofore.

DR. T. L. JAMES : I want to say that I heard a gentleman tell how another gentleman had his office arranged, which was no other than Dr. Bing, of Paris, and he has no light except from a little aperture, and he operates I think, on an average eight hours constantly, and his health has not diminished.



DR. A. O. HUNT: Just a word or two, and that is as to the hygienic effect, or at least the effect of light upon the individual's health. It is fully as important as anything we can consider in relation to it. No doubt about that whatever, but when our eyesight is gone, our occupation is gone; that is the fact about that. It would be true also of our health. If we can get into the sunlight we can take exercise. Any arrangement of this kind is not involved with ventilation, but it is involved with dry sunlight. We can get that in other ways if we would make the effort. There are many things favorable to health in other ways, I find, with the light directed in this way. My chair is almost in a reclining position all the time. That enables me to stand up straight. I am not obliged to twist myself out of shape to get at an awkward cavity, or to stand in an awkward position for hours at a time. If you will call to mind the fact that those of you who have thought of it (many operators do not think of this) that in operating upon the lower teeth the patient should be in the ordinary method of operating, they should have the patient sitting nearly up straight; then you get the light on the lower teeth best. Now, if you will call to mind the position that it places you in to operate, you will have to twist yourself about and be in an awkward and uncomfortable position all the time. But I find the chair becomes more like a couch; more comfortable to the patient and very much more comfortable to the operator, because you do not have to get yourself into an uncomfortable position to operate; and that to me is as desirable in point of health as can be, and we can hardly devise anything in our practice but what there would be objections to it, and there certainly would be the objection of shutting out the light every hour to ourselves. We would be better off no doubt, if we would get the sunlight a portion of the time. That really is the only objection that I see to it in any way, and I find I can get the sunlight by getting behind a good horse, or taking a little walk and in various other ways.

[TO BE CONTINUED.]

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#### NEBRASKA STATE DENTAL SOCIETY.

The fourteenth annual meeting of the Nebraska State Dental Society was held in Garfield Hall, Omaha, May 20 to 23. About eighty members and visitors were in attendance and their appreciation of the efforts of the resident dentists in their behalf is shown

by the following resolutions unanimously adopted by a rising vote at the closing session: Whereas, the dentists of the city of Omaha have been so attentive to the visiting dentists of the State and of the surrounding States, they have not only given their money and time, but the use of their dental appliances and private offices for the benefit of the Dental Society, therefore, be it resolved that this Society tender their heartfelt thanks to the resident dentists of the city of Omaha.

The address of welcome by Col. C. S. Chase of Omaha was well received, and fittingly responded to by Dr. W. W. Vance, of Kearney.

The first session, held Tuesday afternoon, was spent in organizing and disposing of miscellaneous business and at the evening session Dr. H. T. King read a paper entitled "A Day in the Office."

DR. F. M. SHRIVER: I think it a good practical paper, and the essayist correct in his statement in regard to the necessity of using the teeth, as we invariably find that in the mouth where one side is used and the other not, the side used is in a much healthier condition. If you notice some children's teeth you find them chalky and soft, but as they mature, the teeth mature and are better.

DR. I. W. FUNCK: I believe inaction to be one of the causes of poor teeth, but I consider the first cause to be farther back, I ask the essayist how he accounts for soft teeth in the mouths of very young children before they have had time to use them.

DR. W. W. VANCE: There is one point in the paper that should receive attention, that is in regard to the first permanent molar, if not too much decayed, and the operation of restoration of contour too much of a tax on the strength of the child. I try to save them. I have put crowns on them at the age of eight and had them do good service.

In regard to chalky teeth, race has a good deal to do with it: I know many Swedes in my neighborhood. They have poor teeth and I find work for them does not stand well even after using the greatest care in performing the operation. The teeth of the Germans are better.

DR. W. A. IVORY criticised the paper as having too much extracting in it for one day's work, formerly he had trouble to get patients to consent to save their teeth, but does not have so much now.

DR. H. C. VICTOR: I noticed that with the first patient the essayist did not use the rubber dam—he should use it in all cases—I always do.

Dr. King in closing the discussion admitted that there was a good deal of extracting that day, but tried to tell things as they were, not as he would like to have them. He tried to save teeth but found in dealing with people, as they come to a man in general practice, that there were some that it was useless to argue with, and there happened to be quite a number on the day reported. He would go as far as Dr. Vance or any one else to save the first permanent molar if it could be saved with the pulp alive, but if an abscess had once formed, or if it is to become devitalized with all that that means in teeth so young, he thinks it better, as a rule, to extract. In reply to Dr. Funck he stated that it was not the claim that the non-use of the teeth was the cause of their softness, but the use of them the remedy. We do find soft teeth in very young children and the only hope we have of their becoming harder is to put them to work. He does not by any means think it necessary to apply the rubber dam in all cases. There are many cavities that we can do just as well with a napkin where we use amalgam, but as a rule the more inaccessible and difficult the cavity the greater the necessity to apply the rubber dam.

Wednesday morning was devoted to clinics.

After a full discussion of the report of the committee on enforcement of the dental law, an amendment to the constitution was adopted. Sec. II., Art. 9, was made to read: An assessment upon each member may be made by the Executive Committee of an amount not to exceed \$2.00 per annum, for the purpose of the enforcement of the State Dental Law. The said assessment shall be charged against each member the same as dues. The amount received for this fund shall be used for no other purpose unless with the consent of two-thirds of the members of the society present at the regular meeting.

Drs. H. T. King, I. W. Funck and J. J. Willey, were appointed a committee with instructions to push the work vigorously.

A communication was read from Dr. Crouse in regard to the Dental Protective Association, and the following resolution was adopted by the society:

*Resolved*, That we thoroughly endorse the Dental Protective Association of the United States, and urge upon every member of



the dental profession to join the association and to send to Dr. Crouse, Chicago, its chairman, the initiation fee of \$10.00.

PROF. E. H. ANGLE, of Minneapolis, read a paper entitled, "Some Principles to be Considered in the Treatment of Irregularities of the Teeth and Fractures of the Maxillary Bones," following it with about an hour's talk explaining by the use of charts and models his system of regulating in so lucid a manner that all agreed that it would be a great help to them in orthodontia.

What appeared to impress the members most was the simple, yet apparently positive manner in which he is enabled by the use of his appliances to treat fractures of the maxillary bone, having made casts of cases he has treated and removed the appliances from the mouth when union of the bone was complete and placed them in the same position on casts, he is enabled to show not what can be done, but what has been done. His method is to cement bands to the teeth on either side of the fracture with "pipes" soldered to them, passing traction screws through the pipes and draw the parts together, leaving it in place as long as wanted. But if there are no suitable teeth in the maxilla involved, band two upper and two lower teeth and with screws or binding wire bring the jaws together. This seems to retain occlusion in a more perfect and rigid manner than the old-fashioned splints, and certainly with the least possible discomfort to the patient.

Thursday forenoon was devoted to clinics.

At the afternoon session, Dr. W. F. Roseman made a verbal report on "Bridge Work from the Standpoint of a Wearer." He said that at the last meeting one year ago, Dr. F. M. Shriver had placed in his mouth a bridge of five teeth to replace six anterior superior teeth lost long ago, the piece being retained by gold caps over the first bicuspid. For some time after being put on there seemed to be slight irritation around the bicuspid, but now they have become perfectly comfortable, and the longer I wear it the better I like it. I do not favor it, and cannot discover that it springs or gives in biting.

DR. H. N. WARREN said he objected to gold bridges on account of a want of cleanliness, the danger being that foreign substances would work in between the backing and face and become offensive. He very much prefers porcelain bridges.

DR. H. W. SHRIVER: I think it so much more cleanly than rubber that that would cut no figure.

DR. H. T. KING said his experience with broken cases had been that they were not particularly unclean at that point, but if there was any danger we could adopt the plan of some of the old-fashioned gold-plate workers and boil in white wax, that would fill the spaces, if any, with a material that would not become offensive and stay there unless heat was applied.

DR. F. M. SHRIVER thought it a mistake to use light plate to back teeth; use platinum No. 29 and could make it practically airtight; do not think porcelain could be made so strong as gold; have seen but few cases, but prefer gold for strength.

DR. WARREN admitted porcelain not so strong, but it could be pressed into the gum so that nothing can get under it.

DR. SHRIVER could do the same with gold and do it where the bite was short, but was careful not to press the gum too hard.

The subject of Operative Dentistry was presented in a paper by Dr. D. P. Sims.\*

DR. J. W. KEYES: I have been greatly interested, find many points for commendation and no exceptions, unless it be the essayist's lack of appreciation of amalgam and the present forms of alloys. I can say truthfully that I believe a great many teeth are saved by amalgam that would be otherwise lost. I am using it more largely than formerly, and think I do more good than when using gold alone. Cement is not the ideal filling material, even if more durable, it does not imitate enamel; until it does it will not reach my idea of a perfect filling; success, however, is not in the material used, but in the manner of using it.

DR. F. M. SHRIVER: I agree with the essayist in one point, that is that crowns are the most satisfactory operations in dentistry. The shell crowns are the most durable; would put it on if possible, especially if by doing so I could save the pulp alive. Used to extract where the crowns of teeth were nearly gone, but with crowns I can make them the most satisfactory in the mouth for usefulness.

DR. SIMS: Cannot the pulp be saved by filling that can be with a crown?

DR. SHRIVER: I think not, for in all cases where a large mass of metal is used to restore contour, you endanger the life of the pulp.

DR. F. O. HETRICK, Ottawa, Kansas: I think more teeth are cut off and crowned that should be saved than are filled when they should be crowned. Disagree with Dr. Sims in regard to copper

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\* See page 594.

amalgam; I find, with the exception of buccal cavities, that they are not reliable. In very few cases should the amalgam be put in without matrice and mallet.

DR. HUNGERFORD, Kansas City: In regard to the sensitive dentine, I have employed the spray method with great satisfaction, but have just had tried Dr. Hetrick's method of obtunding by electricity, and find it a perfect success in my own mouth; the dentine was cut without pain and no unpleasant sensation from the current.

DR. HETRICK: Do not find it a success in all cases; about sixty per cent, however, report absolutely no pain in excavating.

DR. VANCE: Although called the electric crank of Nebraska, I have not tried it for sensitive dentine, but find sharp burs run rapidly with light touch, the most satisfactory method I have tried.

At the close of the session Dr. R. I. Pearson made a short address "for the good of the order," and urged the members to attend the American Dental Association in August and help to make good the promise, that if they would come West we would give them the largest attendance they have ever had. Nebraska will be well represented, and will "stay with them" until the close.

The officers elected for the ensuing year, are Dr. W. W. Vance, President; Dr. W. H. Stryker, Vice-President; Dr. I. W. Funck, Recording Secretary; Dr. A. W. Nason, Corresponding Secretary.

Dr. H. J. Cole delivered his address as president and introduced the newly-elected president, after which the society adjourned to meet at Kearney, in May, 1891.

#### CLINICS.

DR. G. W. WERTZ filled a crown and anterior proximal cavity in an upper first molar, starting with James Leslie's crystal gold and finishing with Williams' roll gold No. 30, electric mallet, also upper bicuspid anterior proximal and crown, using electric mallet and carrying the gold over a very frail buccal wall. This tooth had been opened up by Dr. H. J. Cole and the dead and putrescent pulp removed, the root treated and permanently filled at same sitting.

DR. F. W. HILL filled a rather inaccessible cavity on bucca surface of third molar, Lawrence amalgam.

DR. F. M. CONNER filled two proximal cavities, upper molars, using Caulk's G and P alloy.



DR. H. W. SHRIVER made a bridge to supply upper second bicuspid and first molar anchoring with gold caps over first bicuspid and second molar.

DR. GEO. A. NASON put a Richmond crown on root of upper first bicuspid.

DR. J. C. WHINNERY demonstrated his method of lining rubber plates with gold by swedging a thin gold plate and covering the entire palatine surface with rubber.

DR. A. W. NASON made and placed in position a gold crown on upper second bicuspid that for shape, occlusion and finish was pronounced perfect.

DR. F. O. HETRICK, Ottawa, Kan., demonstrated his method of obtunding sensitive dentine by use of part of the negative of a vibrating current by means of a third wire around the tooth, patient reported pain very slight in a tooth that with other methods had been unbearable, and the current not unpleasant, others said there was no pain in cutting the dentine but the current of electricity was about as bad.

DR. E. H. ANGLE, of Minneapolis, gave an interesting clinic by demonstrating his method of taking impressions of irregularities and applying regulators.

DR. THEODORE STANLEY, Kansas City, demonstrated by microscopical slides and photographic prints many interesting points in early formation of teeth and tooth structure.

Adjourned.

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#### A PROJECTING GOLD ROOT FILLING EXCISED AND THE TOOTH REPLANTED.

Dr. Etcheparaborda, of Buenos Ayres, reports the following in *L'Odontologie* :

“Dr. — came to him to have a bicuspid tooth extracted on account of periodontitis, which would not yield to treatment. The trouble arose after the tooth had been filled with gold. The tooth was extracted and gold was found to project one millimeter or more beyond the apex. After this was cut off under antiseptic precautions, the tooth was replanted, and in one month it was entirely healed and firm in its socket.”

# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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## THE AMERICAN DENTAL ASSOCIATION.

The late meeting held at Excelsior Springs was in many respects one of the best held for some years, especially as regards attendance. All of the sections reported with from one to three or four papers and most of them evidenced care in their preparation. Dr. Foster presided with grace and dignity and retired from the presidential chair leaving the association in good shape for future work. The most important act of the meeting was the taking of the initial steps toward the great Columbian dental meeting of 1893. By the action of the association in delegating this work to a committee of five in conjunction with the committee appointed at Atlanta and the enlargement of the committee to fifteen, the future of the gathering is assured. The whole committee is composed as follows: L. D. Carpenter, J. Y. Crawford, W. J. Barton, C. S. Stockton, J. Taft, L. D. Shepard, W. W. Walker, A. O. Hunt, G. W. McElhaney, H. B. Noble, John C. Storey, M. W. Foster, H. J. McKellops, J. S. Marshall and A. W. Harlan. The committee organized by selecting W. W. Walker chairman, A. O. Hunt secretary and J. S. Marshall treasurer. We presume that in due time a circular will be issued inviting the coöperation of dental societies, dental colleges and dentists of good repute, generally, to assist in making this a memorable meeting of American dentists.

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The meeting just closed was exceedingly free from friction and the sessions were generally well attended. It is our opinion that the Associations of Faculties and Examiners should either choose

another time and place for their meetings, or meet earlier than they now do in order to give the fullest time possible to the work of the Association. The division of interest is not beneficial to any one of the associations at this time.

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The dental depots were not very numerously represented this year and we opine that it will not be long before they cease to exhibit at all at the annual conventions.

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There were no clinics. A little effort on the part of the local committee of arrangements might provide useful instruction for many of the members by suitably conducted clinics and the appointment of a committee on new and useful inventions.

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The committee on voluntary essays might enhance interest in the meetings by issuing a circular to all dental societies inviting them to name one of their number to prepare a paper and come personally to the meeting and read it at a time when sections might not be ready to report.

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Section work, well the less said of it the better. The sections ought to change officers more frequently and it should be the duty of the secretary of each section to personally correspond with every member and get papers early enough to print a programme of each section in the official document issued by the executive committee.

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The provision in the constitution providing that the officers may change the time and place of meeting should be stricken out, and then the executive committee could go to work and make railroad and hotel rates, etc., in time to make them of benefit to members.

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Another thing might be done to enhance the interest in meetings by providing a permanent meeting place, where a library could be furnished, and a museum; such as the Odontological Society of Great Britain has been collecting for years. This is not a new or original suggestion, but our readers can think of it.

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The next place of meeting has not been determined upon, but when it is selected make up your mind to be there at the beginning and stay until the meeting has adjourned.



## CAPPING PULPS?

Is there any operation more abused than this? The profession has been guilty of all sorts of sinning in connection with it—sins of commission, sins of omission; sins of high degree, sins of low degree. Trespass has been made on all the laws of physiology and pathology, and results have been recorded without due consideration to cause or condition.

Is it a just criterion as to the success or failure of an operation when the operator ignores the simplest principles governing the case? Can pulp-capping be called a success on the strength of claims made by operators who "cap pulps" which are not exposed at all? Many a case has been placed on record as an argument in favor of pulp-capping, where the pulp has never seen the light through its natural covering of dentine. Men sometimes fail to discriminate between a pulp which is nearly exposed and one which has really been brought in contact with external irritants. A thin layer of dentine—no matter how thin, so long as it is healthy—is a better protection to the pulp than any kind of artificial capping we may use. It is a great element in favor of the life of the pulp if the outer layer of odontoblastic cells has never been disturbed by mechanical or chemical irritants, and yet, pulps in this condition have been treated as if exposed, and the success of the operation has been heralded as an argument in favor of the particular method employed. Is this reliable evidence on which to base opinion?

On the other hand, must pulp-capping be discountenanced because pulps have died under cappings whose only redeeming feature lies in the evidence they bear to the beautiful trust the operator has in Nature as a universal healer? Nature will often do wonders for us, but she will not undertake to work miracles in pulp-capping for the benefit of careless dentists in the nineteenth century. Nature will not keep a pulp alive under an excess of septic matter, covered by ever so good a capping material. Dentine so badly disorganized as to lose all function save that of a spongy receptacle for poison-producing micro-organisms, should never be allowed to remain in any quantity. If to avoid a large exposure, it is decided necessary to leave some softened dentine in the cavity, it should be carefully treated with some non-irritating antiseptic previous to capping. In removing diseased dentine near an

exposure, care should be taken not to wound the pulp. The soft, leathery mass should be peeled away in thin layers with rounded excavators. The surroundings of the pulp should be made as clean as possible both mechanically and therapeutically. If there is inflammation in the pulp it should be relieved, and if the inflammation cannot be subdued in reasonable time it is unsafe to attempt capping at all. Ignorance of these details, or carelessness in their application is responsible for many failures, the records of which have helped to throw pulp-capping into disrepute.

As to the advisability of capping pulps it is a matter entirely of circumstance and condition. Probably no other operation in dentistry requires such careful discrimination. Rules cannot be laid down and invariably followed without bringing the operator to grief. The age of the patient is often given as a factor in the case and so it is; but it is not an absolute factor, as we are sometimes led to suppose.

For instance we are told never to cap a pulp for an aged patient, but what shall we do in a case like the following?—An infirm patient presents with an exposed pulp causing trouble from a slow, irritating inflammation. The pain is not excessive—merely a grumble. The patient calls—not for increased pain which would be likely to result from an effort to destroy the pulp, but—for relief from pain. Infirmary pleads against violent suffering. Shall we run the risk of unnerving our patient completely by applying arsenic? or shall we take the more humane method of nursing the pulp into quiescence even if we may not hope to save it alive for long? In this connection we are often told to make the pulp comfortable first and then apply arsenic, but who of us have the heart, after we have once relieved our aged patient, to take the chances of again starting pain even worse than that which we have allayed? We are never sure how much suffering we shall give by applying arsenic? Often when we expect the least we give the most. So in these cases is it better to cap and if the pulp must die let it die of its own accord which it often will do painlessly.

It is with other rules as with this—we must study each case individually, and with a view only to the best interests of our patient. As to methods of capping, there is enough material in it for a future article.

FOREIGN CORRESPONDENCE.

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## SOME "IMPRESSIONS" OF THE TENTH INTERNATIONAL MEDICAL CONGRESS.

*To the Editor of the Dental Review :*

DEAR SIR. The tenth international medical congress, and with it the dental section, has come and gone. In cogitating upon it in respect to the work done, advance made in both theory and practice, of the social intercourse and promotion of good fellowship, I know I am quite in harmony with those in attendance ; that it has been a season of professional advancement that will ever be remembered by the progressive spirits whose presence made it the success it proved to be.

As the meeting progressed it became evident that modifications of the programme of the dental section could have been made to advantage, and one of the most serious oversights of the committee was the utter absence of programmes in English, especially as the English speaking contingent was unusually well represented ; the United States furnishing the greatest number of delegates and visitors, Germany alone excepted.

It was the remark on all sides that the general enthusiasm and personal devotion to the profession, of and by the dentists of America, was the secret of the success of the pioneers of American dentistry in Europe and their respected and envied position at home.

When we find Maine and California shaking hands and greeting the representatives of intervening States in the capitol of a country renowned for the names in science and art, such as have been handed down in history to us, we cannot help but think that while science knows no school or country, the art of our profession must on all sides be admitted to have been cradled, nourished and developed to its present grand proportions in that country which has done so much toward the development and utilizing of genius and resource—America.

The first meeting of the medical congress was held in the Hippodrome, Berlin, a building eminently adapted to the requirements of the large numbers present, with the thermometer at 90°, and a studied opposition to anything in the shape of ventilation, it was eminently suggestive that the guests of Berlin were meeting "with a very warm reception." The amount of work done by the various



sections was enormous, while that of the dental was in no way inferior either in quantity or quality to that of any other section. Original research was a marked feature of the sessions, most of the papers being presented in either French or German. This fact in no way reflects upon the ability or capacity of other countries; for one of the best papers intended for our section found its way into another, owing to much valuable time being taken up by a statistical proliferation of but little interest and less value, while another was curtailed to such an extent as to rob it of its chief charm.

The clinics, as a rule, were good and were highly appreciated, although much better facilities might have been offered for their production; this leads me to believe that the practical work of the dental department of Berlin University is either in an entirely theoretical condition or in the hands of those who wilfully ignore its practical possibilities. Another fact suggests the foregoing as a probably correct diagnosis of the case, *i. e.*, the enthusiasm manifest at the levees held in the extracting rooms; these could have well been omitted from the programme entirely, thereby sparing the feelings of those of a higher sensibility and unused to such scenes, and consequently enhancing the opinions of visitors as to the predilections of the rank and file of the profession in Germany, native talent by its presence endorsing what I hope elsewhere would only be conspicuous by its absence.

"The feast of reason and the flow of soul" to which the dental section was bidden, was an assemblage of comprehensive dimensions and quite in accord with the spirit of the occasion.

During the afternoons enthusiastic demonstrators of special lines of practice presented their views and methods for the edification of their brethren; these men, whose names are household words wherever dentistry is known, dispensed their knowledge with a lavish hand; and in connection with this theme I must note an historic event, *i. e.*, the implantation of a tooth of a mummy known to be upward of 3,000 years old, in the jaw of a young medical man who was willing to have the operation performed at the hands of Dr. Younger, of San Francisco. A peculiar incident was noted in connection with this tooth, *i. e.*, after being buried so long, then exhumed and occupying its place in a skull in the Berlin Museum; it was soaked in water for a short time previous to the operation; when the pulp was removed it was found to represent almost its original proportions, not friable or easily broken down,

but retaining most of its original characteristics. This case will be watched with much interest by those in charge and reports are promised from time to time.

Balls, receptions and excursions were planned for the entertainment of visitors and were fully availed of, much to the gratification of those present. And it is but fitting that a meeting of such importance should conclude in a manner worthy of such an important section as was the fourteenth.

The climax of hospitality and professional fellowship was reached when the guests bidden were gathered around the festal board of Dr. Sylvester at his salon, on Friday evening; here we found the pioneer of American dentistry in France, Dr. Thomas Evans, of Paris, in social communion with his co-laborer, Dr. Sylvester, who occupies a similar position in Germany, recounting their early experiences to their self-expatriated colleagues and friends who so ably represent America from the Atlantic to the Pacific in a common cause. With the grasp of a master mind our host proved himself to be the right man in the right place, for where else than in a royal city and with one of God's own noblemen could such an entertainment have been so successfully carried through as was that one? Noble ideas coupled with fervent sentiment found utterance and met with a hearty response, whose vibrations will still be felt though years elapse and oceans roll between.

Old friendships were here renewed and new ones formed, hearts beat in response when the harmonizing chords of good fellowship were touched, and we felt our lamps of knowledge were again retrimmed when our heart-felt adieu was said to our host ere returning to homes both far and near with nothing but the happiest remembrances of one of the most successful sessions of the dental section of the Tenth International Medical Congress. Yours truly,

W. MITCHELL.

39 Upper Brook St., London, W., England.

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BRITISH DENTAL ASSOCIATION.

*To the Editor of the Dental Review:*

DEAR SIR—The Annual General Meeting of the British Dental Association just held at Exeter, was one quite commensurate with its importance as a professional function; it was ushered in with the usual social reception by the civic authorities of the ancient city of Exeter in a manner quite befitting the reputation of Devonshire

people for hospitality. The work of the session was quite up to the average, and some of the papers read sounded the keynote of what ultimately will prove to be the "forward march" of the present rank and file of the profession.

There seemed to be an impression, as evidenced by the paper of Mr. Campion and the discussion it promoted, that the L. D. S. did not meet the requirements as to the degree desired by dentists here, and notwithstanding the attempt on the part of a few self-constituted legislators to try and make believe that the profession's best interests were quite safe in their (s. c. l.) hands, there is undoubtedly a strong feeling and one that is gaining in strength every day, i. e., that if dentists are able to develop their profession to its present position and to carry on their individual practices in a successful and dignified manner and hold successfully intellectual communion, they likewise possess the capacity of dealing with the political guidance and legislation of all that belongs to the necessities of dentistry, and refuse to believe that a few who hob-nob with and fawn upon the medical profession represent to the best advantage the present progressive spirit of our profession or that the medical profession understands enough of our requirements to legislate for the best interests that our rapid development of necessity demands. And while English legislation has ever been carried out on the principle that might makes right, the dental profession is beginning to wake up to the fact that the many have been used as the tool of the few to further interests that are only to be considered in the light of those of a mutual admiration society.

In connection with this theme, the mutterings of the coming storm were very much in evidence, and I predict that ere long a great change will take place in the London district that will at once and forever sweep away a state of affairs already too long in existence, and institute in its stead a regime that will be productive of the greatest good, and fully represent the spirit and aims of the dental profession of to-day. One grievance of the dental profession is the multiplicity of degrees in medicine, the study of which to a certain point is carried on alike by both dental and medical students. This state of affairs is an injustice to either one or the other, and is an evidence of the fact that medical councillors do not understand the requirements of the dental student; but their ignorance of a subject in connection with others who should know better will eventuate in the much-desired change; *i. e.* a compre-



hensive degree that will confer upon its holders the right to practice general medicine or surgery as in the United States, or a dental *degree* (the present L. D. S. only being a license and not a degree at all), such as conferred by the best institutions in America.

While the methods of conducting dental colleges and their examinations in the United States leaves much to be desired, their efforts are both upward and onward, and the effect of their teachings upon the public will promote an educated clientele who by their exactions upon our profession will promote a rivalry for knowledge and perfection in our ranks that cannot but prove of great and lasting benefit. One paper read impressed upon those present the necessity for a higher mechanical training for the coming dentist, and its opportune expressions carried the conviction its writer desired. At this time when so many in the profession and in our dental colleges are laying such stress upon the necessity for a higher dental education, it would be well for them to awake to the fact that a paucity of undemonstrable ideas and debatable scientific facts (?) could be well replaced by studies and instruction that would develop talent, resource, observation and mental analysis in a manner that would make its members a credit to our profession, instead of as at present, turning out pseudo-scientific fledgelings, possessing but little true mechanical capacity and less scientific knowledge.

This being the case it is no wonder that less than five per cent of dentists make a success in their calling. Now that our dental colleges are extending their courses, let them pay a little more attention to the necessity of teaching their students the fundamental principles of mechanics; we will then find our appliances and materials perfected upon common-sense principles and operations completed in a manner that will be productive of the most good to the patient and prove the highest encomium the operator could wish; we shall then see less of the absurd, faulty and failure-courting operations now so painfully evident, and at our meetings we shall be interested by the presentation of facts logically collated, instead of the hypothetical chimera so painfully and persistently presented, as is now the case.

Dr. Cunningham read a paper, as at Berlin, upon a low, fusible, continuous gum body and enamel; both the paper and the specimens passed around showed evidences of a lot of work; and while there is room for an adjunct to prosthetic dentistry of this kind, we

still seem a good way off from an enamel that will fuse at a low temperature and also possess the soft, translucent and life-like appearance possessed by those working at a higher temperature. It seems that a rather high, soaking heat is best calculated to develop the greatest perfection of ceramics in dentistry, for where a rapid rise and fall of temperature is used or the materials used that work best under such circumstances, they produce a hardness and opacity that are an offense to the artistic eye and stamp at once the seal of a crude artificiality upon work such as is ever the reward of cheap burlesques; and while imitation will ever be the sincerest form of flattery, the position held for the past forty years by Dr. John Allen's continuous gum work, does not at present seem to be in any great danger from its new would-be rival.

The clinics, without which, any dental meeting would now seem shorn of much of its usefulness, were of a varied description; the most notable was that where oxygen and nitrous oxide were used for producing anæsthesia, the gases were administered in the proportion of one part of oxygen to ten of nitrous-oxide. This combination seemed to take rather longer to produce anæsthesia than nitrous-oxide alone, but with the combined gases there was an absence of lividity, stertor or jactitation so incidental to the administration of nitrous-oxide. This should recommend its use to anæsthetists, although its use requires special apparatus to produce the best results. The claim for it that it is much safer than nitrous-oxide alone exists chiefly at present in the imagination, I think, for when we consider the great use of nitrous-oxide and the few fatal cases, and nearly all of these being the result of accidental complications, and not directly attributable to the anæsthetic used, I think it quite premature to depreciate the merits of an old and reliable friend in the interests of an infant not yet out of its swaddling clothes.

Drs. Melotte and Barrett were present and took part in the work of the session; the former giving a very interesting clinic in the use of his varied useful appliances, which from their utility and ingenious construction, elicited very favorable comment.

The social features of the occasion were not lost sight of. With the annual dinner, visits to the horticultural display then on exhibition in the park, the session closed with a grand reception by the president, Mr. Browne-Mason, of Exeter, to meet next year in London.

Yours truly,

W. MITCHELL.

39 Upper Brook St., London, W., England.

## REVIEWS AND ABSTRACTS.

## THE NECESSARY PEROXIDE OF HYDROGEN.

By ROBERT T. MORRIS, M. D., OF NEW YORK.

Stop suppuration! That is the duty that is imposed upon us when we fail to prevent suppuration.

As the ferret hunts the rat, so does peroxide of hydrogen follow pus to its narrowest hiding place, and the pyogenic and other microorganisms are as dead as the rat that the ferret catches, when the peroxide is through with them. Peroxide of hydrogen  $H_2O_2$  in the strong 15-volume solution is almost as harmless as water, and yet, according to the testimony of Gifford, it kills anthrax spores in a few minutes.

For preventing suppuration we have bichloride of mercury, hydronaphthol, carbolic acid, and many other antiseptics, but for stopping it abruptly and for sterilizing a suppurating wound we have only one antiseptic that is generally efficient so far as I know, and that is the strong peroxide of hydrogen. Therefore I have qualified it, not as "good," not as "useful," but as "necessary."

In abscess of the brain, where we could not thoroughly wash the pus out of tortuous canals without injuring the tissues, the  $H_2O_2$ , injected at a superficial point, will follow the pus, and throw it out, too, in a foaming mixture. It is best to inject a small quantity, wait until foaming ceases, and repeat injections until the last one fails to bubble. Then we know that the pus cavity is chemically clean, as far as live microbes are concerned.

In appendicitis, we can open the abscess, inject peroxide of hydrogen, and so thoroughly sterilize the pus cavity that we need not fear infection of the general peritoneal cavity if we wish to separate intestinal adhesions and remove the appendix vermiformis. Many a patient, who is now dead, could have been saved if peroxide of hydrogen had been thus used when he had appendicitis.

The single means at our disposal allows us to open the most extensive psoas abscess without dread of septic infection following.

In some cases of purulent conjunctivitis we can build a little wall of wax about the eye, destroy all pus with peroxide of hydrogen and cut the suppuration short. Give the patient ether if the  $H_2O_2$  causes too much smarting. It is only in the eye, in the nose and in the urethra that peroxide of hydrogen will need to be pre-



ceded by cocaine (or ether) for the purpose of quieting the smarting, for it is elsewhere almost as bland as water.

It is possible to open a large abscess of the breast, wash it out with  $H_2O_2$ , and have recovery ensue under one antiseptic dressing, without the formation of another drop of pus.

Where cellular tissues are breaking down, and in old sinuses, we are obliged to make repeated applications of the  $H_2O_2$  for many days, and in such cases I usually follow it with balsam of Peru, for balsam of Peru, either in fluid form or used with sterilized oakum, is a most prompt encourager of granulation.

If we apply  $H_2O_2$  on a probang to diphtheritic membranes at intervals of a few moments, they swell up like whipped cream and come away easily, leaving a clean surface. The fluid can be snuffed up into the nose and will render a fetid ozæna odorless.

It is unnecessary for me to speak of further indications for its use, because wherever there is pus we should use peroxide of hydrogen. We are all familiar with the old law, "*Ubi pus, ibi evacua,*" and I would change it to read, "*Ubi pus, ibi evacua, ibi hydrogenum peroxidum infunde.*" That is the rule. The exceptions which prove the rule are easily appreciated when we have them to deal with.

Peroxide of hydrogen is an unstable compound, and becomes weaker as oxygen is given off, but Marchand's 15-volume solution will retain active germicidal powers for many months, if kept tightly corked in a cold place. The price of this manufacturer's preparation is about 75 cents per lb., and it can be obtained from any large drug house in this country. When using the  $H_2O_2$  it should not be allowed to come into contact with metals if we wish to preserve its strength, as oxygen is then given off too rapidly.

$H_2O_2$  must be used with caution about the hair if the color of the hair is a matter of importance to the patient, for this drug, under an alias, is the golden hair bleach of the *nymph's dispare*, and a dark-haired man with a canary-colored moustache is a stirring object.—*Journal of the American Medical Association.*

FRACTURES OF THE MAXILLARY BONES. By William F. Edgar, M. D., Los Angeles, Cal.

The following case occurred some twenty years ago, but has never before been reported :

I. S——, a hardy, middle-aged frontiersman and bear-hunter, went, on or about March 17, 1871, out in the Tejon Mountains, in

Southern California, in pursuit of bears, and having reached the desired locality, dismounted, tied his horse and started off, rifle in hand, on a narrow path or trail through the brush, but within a hundred yards or so, suddenly met, face to face, a large grizzly. So close together did they come, indeed, he said, that he did not have time to take deliberate aim, but threw the muzzle of his rifle, as quickly as he could, against the body of the bear and fired. The shot did not kill the bear outright, but only caused him to "bat his eyes (blink) and stagger," but he immediately raised upon his hind feet and struck the hunter with the right paw, raking him from left to right across the chest, tearing the flesh so as to expose some of the ribs and part of the sternum and bringing him down, when the beast took his face in his mouth, lacerating the flesh and crushing the lower jaw, then he let go his hold of the face and the hunter managed to turn face downward. Then the bear bit him in the back, with less damage, however, but in doing so tore off a piece of the hunter's coat, which hung to one of his tusks and this frightened him away. The hunter did not lose his presence of mind, and as soon as he felt assured that his enemy had left him, he raised himself upon a stone near by, where he sat a few minutes and then reached his rifle which was near, and by its aid, raised himself to his feet, and bleeding and hatless, started back on the trail for his horse, and on reaching a point some seventy-five or eighty yards from the place of encounter, he came upon the dead body of the bear. After reaching his horse he said that he came near giving up in despair, as his horse would not permit him to mount, not recognizing him, as he was bloody and could not speak. He, however, finally succeeded in mounting without the rifle and struck for camp, some three miles distant, where he arrived after dark, when his companions put him into a common road wagon and started over a rough mountain road for Los Angeles, about one hundred miles distant. They traveled all that night, all next day, and until ten o'clock at night of that day, when they reached the Sisters' Hospital of this city, and I and the late Dr. N. P. Richardson were summoned to his assistance.

We found the patient very much exhausted, as he had been about thirty hours without food, water or sleep, and the inferior maxilla fractured in three places, besides terrible lacerations of the flesh. On the left side near the ramus there was an oblique fracture, and on the same side, just in front of the mental foramen,

another fracture, transverse, and on the right side a transverse fracture, between the second bicuspid and the first molar tooth.

Opposite each fracture there was a deep laceration of the soft parts, the effect of the animal's tusks. At the fracture near the ramus on the left side, the flesh and beard had been pushed into the mouth, inverted like the finger of a glove, and the first thing done toward repair was the restoration of the soft parts in this locality as far as possible, and then we commenced to adjust and secure the fragments of broken bones with silver wire twisted around adjacent teeth as the best temporary means at least, in view of the exhausted condition of the patient, and after administering such stimulating and nourishing fluids as was necessary, applied the usual support to the jaw and left him till the following morning (Sunday), when we found that the contractions of the digastric, mylo-hyoid, genio-hyoid and other muscles connecting the front and central fragment of bone with the os-hyoides, had drawn the teeth, which were small and rather conical, out of the wire loops and that the patient was but little if any better off than when we first saw him. We then got a dentist to make a thin, malleable, silver plate, perforated with holes opposite the teeth, and this was applied and secured to the fragments with silver wire, and with some feeling of encouragement that we had a retaining apparatus and with the usual external support to the jaw, we left the patient till evening.

At our evening visit we became very much dissatisfied with our apparatus but concluded to risk it till the next morning (Monday), when we might be able to call in some dental assistance if needed. At our morning visit we found the pale and fractured bones again nearly disconnected, and concluded that drilling and wiring the fragments together was the only and last resort that offered the patient any chance for recovery, and we called in two of the principal dentists in the place, Drs. French and Crawford, and after sufficient consultation Dr. Crawford, upon solicitation, drilled a hole through the end of each fragment of bone just below the line of the bottom of the alveolar processes and put a small silver wire through each hole and drew them together on the outside, and after proper adjustment and coaptation, twisted them firmly together. At the fracture on the left side near the foramen, the first bicuspid had to be drawn, as a proper adjustment could not be made there in consequence of the loss of a small wedge-shaped piece of the bone,



leaving a small notch at the root of the tooth. After the adjustment of the splint and external support of the jaw, it was found that the opening made by the drawing of the bicuspid tooth, together with the smallness of the corresponding tooth in the superior maxilla, was just what was needed, as through it nutritive fluids were taken in freely, at first by inserting the small end of a funnel into it, but as the quantity was sometimes greater than the patient desired, a small piece of soft rubber tube a foot long was adjusted to the end of the funnel, which being inserted into the mouth instead of the end of the funnel and being grasped between the thumb and fore-finger of the patient, the quantity he desired to swallow at once was perfectly regulated. No anæsthetic was given the patient during any of these operations, and he complained very little. Between two and three weeks the external support of the jaw was removed and the patient could talk very well, and between three and five weeks the wires were gradually removed, and at about the end of eight weeks he left the hospital with a good jaw. The scars were soon hidden by the growing beard, and the best evidence that his personal appearance was not seriously marred, was that he got married a few months after leaving the hospital. —*Medical Record.*

DENTAL MIRROR, New York, July, 1890. Vol. I., No. 1. Published monthly by the Dental Publishing Company, of New York. Editor: Rodrigues Ottolengui, M. D. S. One dollar per annum.

The *Mirror* is a new aspirant for journalistic honors, appearing in a quarto form and consisting of sixteen pages. It is the object of the editor to fill a certain want among readers of dental journals which is now supposed to be unfilled. The first number is quite unique, and containing, as it does, the thought of many men, obtained by correspondence, and relating to one topic, makes interesting reading. Society reports, editorials, chat, answers to correspondents, etc., occupy a considerable part of the journal. The DENTAL REVIEW wishes all possible success to our confrère and the publishers.

BEECHER'S DENTAL DIRECTORY of the United States. New York: Dr. M. P. Beecher, publisher, 834 Broadway. 1890.

This is the fourth edition of this work, and the 184-page volume contains a list of dentists of the United States, list of dental col-

leges, dental publications and dental trade directory. From the Index of States and Territories, the Indian Territory, whose list of dentists appears on page 37, has been inadvertently omitted. The Territory of Oklahoma, which is not indexed, we presume has no dentists practicing within its borders. While we fully realize the difficulties accompanying the preparation of complete and reliable lists, and while the publisher's motives are highly commendable, we nevertheless take the liberty of suggesting to him to use more precaution in the preparation of the lists. It would be preferable to make them "incomplete" than "incorrect." They should be verified in the localities whence they emanate by dentists, who are well acquainted with the names and addresses of the dentists in that locality. In looking over those portions of the book with whose dentists we are most familiar, we discover many errors. We find the names of some who are dead, some who have removed from the town to which they are credited years ago, and innumerable errors in the initials and the spelling of the proper names.

In the list of dental colleges there are several extinct ones reported, while some established within the last three years are not reported. The list of dental journals, so far as we can judge, is correct. Not being acquainted with the subject of the last item, the Dental Trade Directory, we assume it to be correct.

#### PAMPHLETS RECEIVED.

PROSTHETIC HYGIENE. By Professor J. Hall Lewis, D. D. S., of Washington, D. C. Read before the Washington City Dental Society, March 18, 1890. Washington: Robert S. Cooper, publisher, 1890.

BUREAU OF EDUCATION, Washington, D. C. Circulars of Information.

1. The history of the federal and State aid to higher education in the United States, by Frank W. Blackmar, Ph. D.
2. History of Education in Alabama, 1702-1889, by Willis G. Clark. Government Printing Office, 1890.

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By order of the Committee of Organization of the tenth International Medical Congress, Dr. George Meyer, of Berlin, prepared a "Medical Guide Through Berlin," in the English language. The guide contains all information in regard to matters medical or dental, in the city of Berlin.

We are indebted to the *Dental Cosmos* for the use of the reports of the Association of Examiners and of the Association of College Faculties.

## PRACTICAL NOTES.

## INSTRUCTION IN PROSTHETIC DENTISTRY.

BY L. P. HASKELL, CHICAGO.

In a recent number of the *Ohio State Dental Journal* I published a short article upon the teaching of Prosthetic Dentistry, in which I took the ground that there needed to be radical change made in teaching this branch of dental science. As at present conducted it is very unsatisfactory to the student. Of this I am constantly being impressed by the interviews, personal and by correspondence, with dentists who are graduates of the various dental colleges; men who did not seek to evade the laboratory while in college, but were anxious to learn, and now realize how inadequate was their instruction at college. There recently met at our school as students, three graduates of a Philadelphia college, classmates, who had not met since their graduation, several years ago; one from North Carolina, one from Indiana and one from Iowa.

Under existing circumstances it cannot well be otherwise. In the first place, prosthetic dentistry cannot be taught in the lecture room; as a rule, too much of the valuable time of the student is spent there. In the second place, the lecturer should have a well-defined theory and method of his own and not confuse the mind of the student with a variety of methods, some of which were perhaps long since obsolete. Thirdly, he should have a sufficient remuneration for his services to enable him to demonstrate, personally, in the laboratory his methods and not leave it to demonstrators who are often recent graduates with little experience, sometimes, also, demonstrating methods of their own and so confusing the student.

Just what changes to make and how to accomplish them is the question. One thing is certain, more time ought to be devoted to technical instruction in prosthetic than in operative dentistry, for it covers a much broader field, is more difficult to master and is fully equal in importance.

I fully believe that more satisfactory results could be accomplished by condensing the instruction in this department into a certain number of weeks at the end of the term, if that were feasible. Then, too, if the necessary results cannot be accomplished otherwise, send the graduate forth with less of theory and more of the practical. As it is now, he is crammed full of theory; can tell you



all about the bones, nerves, blood-vessels of the foot, but is totally unqualified to construct a denture of gold, and oftentimes not a correct one of rubber.

I speak advisedly upon this subject, having had four years experience in one college, three years in another, and having given clinics of one to four weeks in four other colleges.

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## MEMORANDA.

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The Dental Protective Association received a great "boom" at Excelsior.

Dr. Frank Overholser, of Logansport, Ind., was a recent visitor to Chicago.

Dr. W. L. Croll, of London, England, paid a flying visit to Chicago in September.

Steps were inaugurated looking toward the appointment of dentists to the Army and Navy.

Dr. C. T. Gramm is the new lecturer on dental pathology and surgery at the Keokuk Medical College.

A cablegram of greeting was ordered sent to the dental section International Medical Congress, Berlin.

Dr. E. E. Hughes, of Des Moines, Iowa, is an adept at recitation, as was discovered at Excelsior Springs.

A resolution asking Congress to pass a bill for the regulation of the practice of dentistry in the District of Columbia, was passed.

One of the naturally gifted orators of the South was present at the American meeting in the person of Dr. J. Y. Crawford, of Tennessee.

Missouri, Iowa, Kansas and Illinois, might have been denominated the "big four" at the late meeting, as they turned out in large numbers.

And the president was overcome—Minot G. Jenison, M. D., Fannie A. Smith, married Thursday, August 28, 1890. Accept congratulations.

Dr. R. F. Ludwig has returned from the International Medical Congress. In consequence of illness he was unable to give a clinic at the Dental Institute.

Dr. W. P. Richards, who has been practicing dentistry for several years at Englewood, Ill., a suburb of Chicago, has removed to his former home, Elgin, Ill.

Dr. R. S. Wells, a Chicago dentist, was instantly killed at Janesville, Wisconsin, last month, by being run over by the cars as he was stepping into the train.

Drs. Wm. Barker and W. P. Church, of Rhode Island, are among those who not only know a good story when it is told, but they are masters of the art in their own persons.

Got left. Drs. Gardiner and Foster failed to catch the special to Chicago Friday p. m. The cable railways possessed for them charms too potent to permit them to get away.

"93" will see the largest assemblage of dentists gathered in Chicago that the world has ever witnessed. Get ready with your paper, exhibits, new inventions, etc., for the great event.

Two colleges were admitted to the National Association of Dental Faculties, viz.: Dental department of the University of Minnesota, and the American College of Dental Surgery, Chicago.

A New Hampshire dentist has put up a sign, "Teeth pulled while you wait," and draws much extra patronage from people who do not stop to think that teeth cannot be pulled in any other way.

Drs. W. W. Walker, of New York, E. G. Betty, of Cincinnati, and C. P. Robinson, of Mobile, Ala., were among recent visitors to the Western Metropolis. Dr. Walker was on his way returning from the far west.

A dental society has been organized in Quincy, Ill., to be known as the Quincy Dental Society. The following is the list of officers: President, Dr. Walch; vice-president, Dr. Willman; secretary-treasurer, Dr. Gardner; corresponding secretary, Dr. Hart.

The executive committee of the A. D. A. was authorized to issue a circular to all dental societies and, in fact, to the whole profession, inviting their coöperation in making the next and succeeding meetings of the association too valuable to be missed by any progressive dentist.

From the report of corporations chartered during August, 1890, in the State of Illinois:

"Surobotupni Uknovay Boszius-Rulo, for educational purposes; capital stock, \$5,000. Incorporators, Francis Bolucski, Arinom Wandulko and Demetrich Myrauski."

This is undoubtedly another dental college under some clever disguise.

Dr. K. B. Davis, who was absent in Europe on account of his health, incidentally attended the Tenth International Medical Congress in Berlin. He reports having a splendid time, being much improved in health by his stay in Carlsbad. Dr. Davis likes Berlin very much; he considers it more of an American city than any others he has visited.

At the late meeting of the American Dental Association held at Excelsior Springs, there were representatives from Rhode Island, Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Maryland, District of Columbia, Georgia, Tennessee, Mississippi, Texas, Arkansas, Kentucky, Indiana, Ohio, Michigan, Wisconsin, Illinois, Minnesota, Iowa, Nebraska, Colorado, California, Kansas, Missouri and Canada.

#### NORTHERN ILLINOIS DENTAL SOCIETY.

The Northern Illinois Dental Society meets at Rockford, Wednesday and Thursday, October 15th and 16th.

T. W. BECKWITH, Sec'y.

#### INTERNATIONAL MEDICAL CONGRESS.

According to the list of dentists attending the dental section, there were 28 Americans from the United States who took part in the proceedings.—*Journal für Zahnheilkunde*.

## THE CHICAGO ANÆSTHETIC CLUB.

This club has been organized to enable physicians and dentists to gain further knowledge of anæsthetics and their administration than can be obtained in colleges. At the meeting held August 5, 1890, the following officers were elected: President, Dr. Geo. Leininger; vice-president, Dr. B. J. Roberts; secretary, Dr. B. J. Cigrand; Treasurer, Dr. Leon T. Hale; librarian, Dr. P. J. Cigrand, and Drs. J. B. Williams, E. Pfennig and M. Leininger trustees. Dr. B. J. Cigrand delivered an eloquent address on anæsthesia, after which the club adjourned to meet in September at a place to be determined by the officers.

## MINNESOTA STATE DENTAL ASSOCIATION.

The following are the names of the officers of the Minnesota State Dental Association for 1890-91: President, M. G. Jenison, Minneapolis; Vice-President, W. C. Merrill, Albert Lea; Secretary, L. D. Leonard, Minneapolis; Treasurer, H. M. Reid, Minneapolis; Chairman Executive Committee, E. F. Clark, Minneapolis, (elected); Master of Clinics, C. A. Van Duzer, St. Paul, (elected). Appointed by the President, J. M. Welch, St. Paul; E. K. Clements, Faribault; T. E. Weeks, Minneapolis. Membership Committee: F. H. Brimmer, Minneapolis; L. W. Lyon, J. H. Martindale, L. C. Davenport, M. R. Metcalf.

Respectfully yours,

L. D. LEONARD, Secretary.

## TENTH INTERNATIONAL MEDICAL CONGRESS, BERLIN.

The list of names registered comprises 5,737. Of these there were credited to Berlin, 1,126; Germany (except Berlin), 1,752; foreign countries, 2,959. The latter were divided as follows: United States, 659; Russia, 429; Great Britain and Ireland, 358; Austro-Hungary, 262; France, 179; Sweden and Norway, 165; Denmark, 139; while the remainder were representatives, small in number, of various countries.

In the section on Dental and Oral Surgery, there were (according to the *Journal für Zahnheilkunde*, whose editor was present), 308 names registered, divided as follows: Berlin, 58; Germany (except Berlin's 73), 131; Denmark, Sweden and Norway, 39; Russia, 33; England, 26; America, 24; France, 10; other countries, 31.

The following is a list of the names of Americans which were entered as being interested in Section XIV: R. R. Andrews, D. D. S., Prof. Cambridge; Otto Arnold, D. D. S., Columbus, O; W. C. Barrett, M. D., D. D. S., Buffalo, N. Y.; Jos. Bauer, D. D. S., New Orleans, La.; Dr. E. C. Baxter, Albany; Emma Benham, M. D., D. D. S., Chicago; Dr. F. S. Buckley, Ann Arbor; Dr. Wilhelm Caillé, New York; Dwight M. Clapp, D. M. D., Boston; G. L. Curtis, M. D., D. D. S., Syracuse; L. E. Custer, D. D. S., Dayton, O; Emil Fuerth, D. D. S., New York; Dr. James Goodwillie, New York; Dr. George W. Harris, Washington; V. H. Jackson, D. D. S., New York; R. F. Ludwig, D. D. S., Chicago; Prof. J. S. Marshall, Chicago; Dr. H. J. McKellops, St. Louis; Dr. Wm. N. Morrison, St. Louis; Edward S. Niles, D. M. D., Boston; L. D. Shepard, D. M. D., Boston; George D. Sitherwood, Bloomington; A. R. Starr, M. D., New York; R. Starr, D. D. S., Philadelphia; S. G. Stevens, D. D. S., Boston; Eugene S. Talbot, D. D. S., Chicago; C. A. Timme, D. D. S., New York; W. J. Younger, M. D., San Francisco.



## WORLD'S COLUMBIAN DENTAL MEETING, 1893.

The American Dental Association concurred in the following resolutions, adopted by the Southern Dental Association, and appointed the undermentioned committee:

WHEREAS, There is to be a World's Columbian Exposition in Chicago in 1893; and whereas, in consequence of the fact that the choicest products of the world are to be there displayed, it is expected that citizens in large numbers, of all civilized countries, will be gathered together there for the purpose of seeing these exhibits; and whereas, it is to be presumed that many dentists from foreign countries will visit the United States at that time; and whereas, the time of the exposition will be an opportune occasion for a great meeting of dentists of the world; and whereas, it is believed that a great advance in the science and practice of dental and oral surgery would result from a meeting of the dentists of the United States with those from foreign countries who might then be visiting this country; and whereas, it is desirable that any meeting then held should be at the instance of the American Dental Association and the Southern Dental Association, and organized by a joint committee by them appointed; therefore be it

*Resolved*, That the president of this association appoint a committee of five, to confer with a like committee that may be appointed at the next meeting of the American Dental Association upon this subject, and that this joint committee have power to fill all vacancies, and shall add to its membership either one, three or five more members as it may deem advisable; and when this committee is so completed, it shall be clothed with full power to take such action as it in its judgment may deem best for creating an organization for the purpose of holding a dental meeting in Chicago in 1893, which the reputable dentists throughout the world shall be invited to attend, and that any action that this committee may take in the premises shall be final and binding.

In accordance with the above, Drs. W. W. Walker, New York, L. D. Shepard, Boston, H. B. Noble, Washington, A. O. Hunt, Iowa City, and G. W. McElhaney were appointed the committee from the American Dental Association. The committees then met and appointed the following additional members, provided by the resolution: M. W. Foster, Baltimore; John C. Storey, Dallas; John S. Marshall, Chicago; A. W. Harlan, Chicago, and H. J. McKellops, St. Louis. The whole committee then met and elected W. W. Walker Chairman, A. O. Hunt Secretary and John S. Marshall Treasurer. After appointing a few committees and adopting rules and regulations the committee adjourned subject to the call of the chairman.

## RESULTS OF BACTERIOLOGICAL RESEARCH.

Upon this subject we quote the concluding portion of the able address of Dr. Robert Koch, at the late meeting of the International Medical Congress at Berlin. His words are as follows:

"I am convinced that bacteriology will one day be of the greatest importance from the therapeutic point of view also. It is true I look for relatively smaller therapeutical results in the case of diseases with a short incubation period and a rapid course. In these diseases, as for example, in cholera, the chief reliance will always have to be placed on prophylaxis. I am thinking more of diseases of less rapid course, as these offer more points of attack to therapeutic enterprise.

And there is scarcely a disease which, partly on this ground, partly on account of its far surpassing all other infectious diseases in importance, so challenges bacteriological investigation as tuberculosis.

"Moved by these considerations, very soon after the discovery of the tubercle bacilli, I set about seeking for substances which could be used therapeutically against tuberculosis, and I have pursued this search, which has, of course, been often interrupted by my other occupations, perseveringly up to the present. In the belief that there must be a remedy for tuberculosis, I do not by any means stand alone.

"Billroth has, in one of his late writings, expressed himself with all possible distinctness to the same effect, and it is well known that the same object is aimed at by many investigators. It seems to me, however, that the latter have not as a rule followed the right way in their investigations, inasmuch as they have begun their experiments on man. To that I ascribe the fact that everything which people have believed themselves to have discovered in that way—from benzoate of soda down to the hot-air treatment—has proved to be a delusion. Experiments must be made in the first place not on man, but on the parasites themselves in their pure cultures; even if substances have been found which have the power to check the development of tubercle bacilli in the cultures, man should not forthwith be chosen as the subject of experiment. But the question whether observations which have been made in a test tube hold good also in living animal bodies should first be settled in animals. Only if the experiments on animals have proved successful, should the method be tried on man.

"Proceeding according to these rules, I have, in the course of time, tested a very large number of substances to see what influence they would exert on the tubercle bacilli cultivated in pure cultures, with the result that not a few substances have the power, even in very small doses, of hindering the growth of tubercle bacilli. More than this, of course, a remedy cannot do. It is not necessary, as has often been erroneously assumed, that the bacteria should be killed in the body; in order to make them harmless to the body it is sufficient to prevent their growth, their multiplication.

"I have proved the following substances to be remedies which hinder such growth even in very small doses (to mention only the most important): A number of ethereal oils; among the aromatic compounds, *B* naphthylamin, paratoluidin, xylidin; some of the so-called tar dyes, namely, fuchsin, gentian, violet, methyl blue, chinolin yellow, analine yellow, auramin; among the metals, mercury in the form of vapor, silver and gold compounds. The compounds of cyanogen and gold were especially conspicuous, their effect surpassing that of all other substances; even in a dilution of 1 to 2 millions they checked the growth of tubercle bacilli. All these substances, however, remained absolutely without effect if tried on tuberculous animals."—*Journal of the American Medical Association.*

# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, OCTOBER 15, 1890.

No. 10.

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## ORIGINAL COMMUNICATIONS.

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### REFLEX NEUROSES WITH WHICH THE TEETH ARE ASSOCIATED.

A lecture delivered before the Practitioners' Class in the Chicago College of Dental Surgery, 1889.

By W. P. DICKINSON, D. D. S., MINNEAPOLIS, MINN.

GENTLEMEN :

I am sure the facts will bear out the assertion, that the subject of "Reflex Neuroses, with which the Teeth are Associated," has not received the systematic attention at the hands of dentists or medical men that its importance calls for. It is true that scattered through the periodical literature, quite a number of isolated cases—probably several hundred—are reported, where the origin or seat of affections *supposed* to be in the teeth, were finally discovered to be *remote* from them, and that other disorders, not in *any way* thought to be dependent upon these organs, were traced directly *to* them ; but excepting the collection of cases and classification by Prof. Brubaker, of Philadelphia, I am not aware of any attempt ever having been made to group the *causes* and *effects*, together with illustrative examples, in such a manner that they might be conveniently studied. Speaking of such study, he says, "The simplest lesson to be found in any one of these cases—and one that is immensely emphasized if they be reviewed *en masse*—is one that is hardly recognized at its true value by the dental surgeon, or by the general practitioner—it is this :

1. A pain in a tooth by no means indicates that the tooth is the source of the trouble ; it may be in another tooth, or in other tissues near or remote.



2. Dental disorders may induce pathological conditions in other parts of the body, or in the nervous structures themselves, without the existence of any subjective intimations of pain in the teeth on the part of the patient. In other words, one may have toothache in the brain, the ear, the stomach or the hip-joint, or one may have headache, gastralgia, etc., etc., in the teeth."

I do not think it would be at all profitable at this time, to undertake the task of unravelling to any great extent, the complex details relating to the physiology and functions of that more than "complex system of sensory, motor, vaso-motor, trophic and secretory nerves." For, as the author quoted remarks, "the questions involved are of the profoundest interest and importance, but are little understood even by the best investigators," and "volumes have been written concerning the theories of counter-irritation and reflex neuroses." There are, however, some general laws, with some specialized manifestations that are well understood; these taken in connection with the study of reported cases, followed up by personal clinical observations, should result in additional knowledge, and a corresponding benefit to those suffering from these affections.

What we mean by "reflex pain," may have been already inferred, but a definition or two may help our understanding of the term. Brubaker says, "a centripetal or afferent (sensory) current travels from an irritated point toward a center, and re-appears as a centrifugal impulse which excites activity either in muscular, glandular, vascular or secretory tissues." He then graphically compares "the central nervous system, (and especially the medulla,) to a sort of intricate switch-board of a large telegraph office, where the myriad wires are focalized." "When in normal action, the connections are such that a message from any peripheral point is shunted (switched or conducted) to its proper receiver, transferred to another wire and sent into other and higher offices."

"Now, most of the pathological instances gathered here, seem to be the results of a disordered state of affairs at the switch-board—viz., the medulla oblongata."

As far as concerns any adequate comprehension of the mysterious workings of the medulla, either in health or disease, we are very much like an individual wholly ignorant of, and standing before the switch-board and the unheard-of telegraphic machines."

Another author gives as a definition of reflex action the propagation of an impression made on the extremity of one nerve, to the extremity of another, through the intervention of the nervous centers." And, once more, we have *reflex pain* defined as "that which originates in one locality, the sensation passing back to a nerve center, and from there reflected along the line of other nerves centering in the same ganglion."

Now, with this proposition, relating to the course or track of the nervous impulse, we might reasonably inquire into the nature or mechanism of it; in other words, *How* is the painful sensation transmitted? Martin in speaking of the nature of the nervous impulse, says, "We cannot well imagine it anything but a mode of motion of the molecules of the nerve fibers; but beyond this hypothesis we cannot go far."

Another author, says, "I take it that all these operations proceed on the principle of contact; it is all a matter of touch; the sensitive cell is simply the ultimate cell exteriorly of a series of cells; it is the extreme end of a nerve filament. The first cell being touched, touches the second, the second the third, the third the fourth, and so on till the central cell is reached. What matters it that all is done in an inconceivably short space of time? It is touch, vibration, modified tension, as you please to name it."\*

In the preface of a recent work—"Hand-book of Treatment," by Professor William Aitkin, M. D., (Edinburgh)—he says, "There is perhaps no more striking characteristic of the medical practitioner of to-day, and none better illustrating the pervading spirit of the age, than the universally observed tendency \* \* \* \* \* to shun the unrealities of theoretical discussion and to appropriate with avidity only *facts* which he can instantly transform into working force." In a direct line with this thought, I propose to cite a few illustrative cases, where dental lesions have provoked disturbances in other parts of the general system, on the one hand, and where systemic affections have manifested their effects in the dental organs, on the other.

It is almost a daily occurrence, with every dentist having an ordinary practice, that patients present themselves complaining of "toothache" and locate the pain in a tooth other than the one causing it. Unfortunately many valuable teeth are sacrificed,

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\*(It is an interesting fact that "the rate of transmission can be measured in several ways, and is far slower than that of electric currents. In man it is 108+ feet per second, about  $\frac{1}{10}$  of the rate of the transmission of sound waves in the air at zero. In the motor nerves of the frog it is 94 feet.)

causing both disfigurement and discomfort to the patient, by overlooking the possible reflex nature of the pain, in the diagnosis. From the fact that the *offending tooth itself* may give forth no painful sensation, the diagnosis sometimes becomes complicated; a very careful search about *every* tooth (both above and below on the side of the face affected), particularly on the proximal surfaces and under the free margins of the gums, using very fine-pointed exploring instruments and illuminating the oral cavity with the mouth-mirror, will usually disclose the origin of the trouble. Tapping the tooth (percussion) with a steel instrument is often a valuable aid in diagnosis, especially in cases where there is periodontal complications. Besides the attempt, by patients, to definitely locate the pain, it is almost as frequent that the complaint is spoken of as "*new-ral-a-gy*," sometimes referred to the ear, at others to the orbital region, to the eyeball, to the entire side of the face, etc.

"From the recorded observations of various clinicians, no doubt remains that dental irritation may give rise to neuralgia in many nerves, and more particularly in the branches of the trigeminal itself. The peripheral irritation in such instances, after being reflected to the nerve centers, instead of passing over to adjoining *motor* centers, induces some pathological condition in the nervous structures themselves, which manifests itself as pain.

Whatever the pathology of facial neuralgia may be, it seems unquestionable that the disease may be caused by dental irritation, and in such instances often cannot be distinguished from a neuralgia induced by any other cause."

In several papers by Neucourt, published in the *Archives Générales* from June, 1849, to Dec., 1853, he cited seventeen cases, and laid down some rules for diagnosing a neuralgia of dental origin. Very briefly they were:

1. "When a tooth is in itself the seat of pain, and the patient *definitely specifies* it as such, there can be no doubt that it is the origin of the disorder."

(This is not always the case as will be seen further on.)

2. Should there be in addition to the pain, swelling and inflammation of the cheek with indications of abscess, or the tooth painful to percussion, or seems longer than the others, the indication is decisive whether it is carious or not."

3. "Even if the pain is diffused over the side of the face and



presenting all the typical signs of neuralgia, nevertheless, if it eventually localizes and limits itself to the region of the dental arch, accompanied with pain, redness and swelling, with extreme sensibility to pressure, indicating a *possible* termination in abscess, such disturbance is of dental origin."

4. A distinguishing mark of dental neuralgia is the persistent discomfort of the patient; while in the neuralgias from other causes, there are periods of calm."

Friedburg (cited by Brubaker) has reported in detail, (Virchow's Archiv. Band XVIII.) several typical cases of neuralgia due to dental irritation. I can do no more than to make brief abstracts from these reports, for obvious reasons.

One was a patient æt. 37, a working woman who began to be troubled with pains accompanied by swellings in the finger-joints. She attributed them to washing in cold water. Sometimes the pains extended up the arms, even to the shoulders. After two or three years of this misery, oft-repeated attacks of neuralgia in the left side of the face supervened, with prickling, burning and darting pains, which shot from beneath the ear through the cheek and temple. At times the eye and forehead seemed to be the seat of the assault; *then* they were specialty severe. She did not know whether the *teeth themselves* ached during the attacks or not, but was positive the beginnings of these seizures were *not in them*. After suffering for five years with variable periods of freedom from the attacks, some times as long as two weeks, the extraction of the cuspid and third molar of the upper jaw, which were carious, gave instant relief, and the next day she reported the first night's rest for a long time. The cure was complete.

The remaining cases present similar details; one covering a period of a year, and the others several months each. The muscles of the face, the eyelids and lips being seized with twitching, were the peculiarities. In one, memory began to fail and the general health gave way; but in *each*, the extraction of affected teeth or diseased roots, was followed by a cure.

*Neuralgia* having its *origin in the teeth*, does *not depend* upon those organs being *carious*.

Dr. Alfred Gysi reports a case where the patient had suffered several weeks with excruciating pain in the right upper maxilla, which radiated at intervals all over that side of the face. She was the unfortunate possessor of several carious teeth, which were

removed in the hope of relief, but not having obtained it, she concluded, as so many of her teeth were lost, to have the right central incisor (which was quite isolated) removed for the purpose of wearing an artificial substitute. Though this tooth showed no signs of decay or exostosis, its removal was followed by instant relief. A microscopical examination of it showed the presence of six nodules of secondary dentine, projecting from the walls of the root portion of the pulp canal, materially diminishing its calibre and compressing the root portion of the pulp.

*Hypercementosis* (dental exostosis, excementosis) is also another source of neuralgia. This excessive development of the cemental tissue "cannot be called a common one, but is too frequently met with to be considered rare".

Its growth is slow, and probably in very many cases, its presence is never known or suspected, but in others, there are instances where serious results have been reported. Prof. Frank Abbott, of New York, relates a case where a patient suffered for ten years with neuralgia on both sides of the face, and had submitted to the severance of both facial nerves, at different times, once in London and once in Paris, without relief. Finally, her dentist located the cause of her distress in one of her teeth, which he removed, with the happy result of immunity from further trouble.

Prof. S. H. Guilford, of Philadelphia, relates a somewhat similar case where the patient had suffered many years.

None of the teeth had lost their vitality, neither was there soreness in any of them. At last hypercementosis was suspected and one of the lower third molars was extracted.

This confirmed the diagnosis, and as such a measure of relief was experienced, the one on the opposite side of the jaw was also removed and an almost complete cessation of the pain followed. A far more serious case of disturbance is mentioned in the Proceedings of the Buffalo Medical Association where a gentleman had for many years suffered from what was called neuralgia, and finally became insane.

In the course of time he was brought to his dentist for the extraction of a tooth, which was accomplished only after using extraordinary force, when there was found on its roots an abnormal growth near the crown. The neuralgia ceased and soon the patient was restored to sanity.

Tomes reports two cases of epilepsy caused by hypercementosis,

"exostosis of the roots" as designated by him. Quite a number of cases have been reported, in which the mental faculties had lost their equilibrium by reason of dental irritation, and I will at this point digress so far as to cite some of the most interesting of them.

Perhaps the more correct way would be to report each, under the head of the specific causes in the regular course of the lecture, but I prefer to group them together here, and will state the causes of each as we proceed.

The occurrence of insanity, as a result of irritation and pain caused by the emergence (eruption) of the teeth, was first noticed and commented upon by Esquirol ("Insanity," Am. Ed., 1845, p. 197.) He says, "Among subjects of a lymphatic and nervous temperament, the pains of the first dentition sometimes become the cause of insanity. The appearance of the teeth through the gums causes all the symptoms to cease. I have observed this in the case of three young girls."

Prof. C. N. Peirce, Phila., relates a case of insanity caused by the presence of pulp-nodules, the patient dying in an asylum.

Mr. D. Corbett (Int. Med. Congress, Trans., 1881, p. 475) mentions a case of a 13-year-old girl, of naturally weak intellect, who became insane from over-crowded teeth, the removal of the first bicuspid on either side caused disappearance of the mania.

Dr. Tyler related two cases before the Boston Society for Medical Improvement, of mania from carious teeth which were cured by their removal. And Dr. D. T. Pepper gives an interesting account of mental aberration from faulty condition of the teeth. The teeth were extracted, but a cure was not effected until after a portion of the inferior dental nerve a half inch long was removed, then the patient permanently recovered.

In the Dublin Medical Press (1861?) is an account of a young man, æt. 18, who committed suicide after 4 or 5 months' "excruciating torture from toothache." The coroner's jury gave a verdict of "suicide while laboring under a fit of temporary insanity."

Returning to the point of digression, I remark, that pain in different parts of the face and ears is often caused by inflammation of the dental pulp. The typical pain of phagedenic pericementitis (pyorrhœa alveolaris) is not very severe, usually, but is also diffused more or less to the cheek, malar process and temple.

But the reflex expressions from *carious teeth* are so numerous as



to almost stagger one's belief ; and were it not for the fact of the cases being recorded by observers of acknowledged ability in diagnosis, some of the reports might reasonably be discredited.

Magitot says, "Disturbances \* \* \* are caused in the senses of smell and taste by caries of the teeth in relation with nervous ramifications to the sensorial regions. Of the accidents produced in the sense of smell, we may instance certain lesions of the maxillary sinus occurring under the influence of the decay, either of the second bicuspid or of the first or second molar." Then again, epilepsy or epileptiform attacks are quite frequently referred to carious teeth.

The famous Dr. Benjamin Rush, of Philadelphia, gives in "An account of several cases of general diseases cured by the extraction of decayed and diseased teeth," in a letter to Dr. Miller, the following : "Some time in the year 1801, I was consulted by the father of a young gentleman in Baltimore, who had been affected with epilepsy. I inquired into the state of his teeth\* and was informed that several of them in his upper jaw were much decayed. I directed them to be extracted, and advised him afterward to lose a few ounces of blood at any time when he felt the premonitory symptoms of a recurrence of his fits. He followed my advice. In consequence of which I had lately the pleasure of hearing from his brother that he was perfectly cured." Tomes quotes Dr. Ramskill (*Med. Times and Gazette*, 1862) who relates that "a boy aged 13 has had frequent attacks of epilepsy for the last eighteen months.

Latterly his mother has noticed that some days he rubs his left cheek, complaining of faceache, after which the fit follows. On examining the mouth there is to be seen a molar tooth considerably decayed, with a swollen gum around it, and partly growing into the cavity ; it is not very tender to the touch, and the examination does not give rise to the toothache. On questioning, I find the sensation which the boy experiences before a fit, does not seem to be one of pain, but rather an indefinite uneasiness. He always has a fit the night this comes on ; he never felt it during the day."

The tooth was ordered extracted and he had no recurrence of the attacks. I find frequent reference to convulsions caused by carious teeth ; sometimes characterized as "epileptic" or "epileptiform," and at others by the general term alone.

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\* Too frequently neglected by physicians, even now. (D.)

That reflex paralysis should occur, involving the face, arms and legs, in consequence of dental irritation, might also be questioned, were it not that the proofs are abundant, showing that after the removal of the supposed cause of the lesion, the paralysis gradually passed away, and the muscles resumed their normal action. "It is of course impossible to state," says Brubaker, "*why* or *how* the neural irritation, after being reflected to the Trigeminal center, inhibits the activity of both the medullary and spinal motor centers.

Whatever the true pathology may be, there is a cessation in the discharge of efferent impulses through the motor nerves, so that the motility of the corresponding muscles is temporarily impaired. The *central* trouble is most probably functional in character and not connected with foci of inflammatory action."

Facial paralysis seems to be the most common form, but various other manifestations have been noted. One was stricken *suddenly*—another a girl aged 18 noticed a stiffness in the muscles of her face. In twenty-four hours complete paralysis of the left side took place. After three weeks she was advised to have several defective teeth extracted—she had thirteen removed—this was followed by improvement in the course of five days. Electro-galvanism was then employed and the patient entirely recovered. In addition to such cases as these we find in Guy's Hospital Reports (1868, p. 93), a record of the case of a patient (woman) who suffered from constant aching pain in the left side of the face and neck and in the left arm. The pain sometimes became intensely severe. The arm had lost nearly all muscular power; the patient could not raise it to her head, nor squeeze any object in her left hand. This state of things had existed two years, and she had been under medical treatment all the time. Upon examining her mouth, a carious left lower third molar was observed, which was extracted. The record goes on to say, "She *immediately* felt great relief and in a *few hours* all the symptoms had *completely* disappeared."

Tomes quotes from the London Lancet (Jan. 22, 1859) a most interesting account of a singular example of disordered muscular action, which was related by Mr. Hancock. "The patient, a young woman, had suffered for upward of six months with spasmodic wry-neck (Torticollis) and had submitted, without avail, to the usual treatment of counter-irritants, and various internal remedies." The only discoverable possibility as a source

of irritation was a carious stump of a tooth which was removed and a cure, in a few days, was the result.

In addition to the cases cited, carious teeth have been shown to be responsible for pains in the neck and arms, *Trismus* (Cosmos vol. xi p. 271, vol. xv p. 475, vol. xxi p. 50,) and *Tetanus* (Tomes Dental Surgery p. 591. Cosmos, vol. v. p. 434). *Hysteria*, (B. W. Richardson on the Teeth, 1860, p. 84), etc., etc. Much might be said as to the reflex disturbances which take place in the eyes and ears as a result of carious teeth, but it will be impossible to do more than allude to them.

Tomes says, that "a *very large* number of well-authenticated cases have been recorded, in which not only functional but organic disease of the eye has been distinctly traced to the presence of diseased teeth," and cites several cases, one of which was an adult who had strabismus for three years and ptosis a portion of the time, caused by decayed teeth—removal and cure.

"Sir Thomas Watson (Lectures on Physic 4th ed.) mentions a case in which blindness confined to one eye, recurred three or four times, always being cured by the extraction of a carious tooth." Again, Tomes quotes from the "Dublin Medical Free Press" a case where a patient "suffered for *fourteen* years from congestion and lachrymation from one eye and photophobia, these symptoms being aggravated by unsuitable diet. The symptoms began to amend, and soon disappeared after the extraction of a carious tooth.

Mr. Power (Lancet, Apr. 9, 1881) gives details of a case of double ptosis, the patient a woman, aged 33.

Dr. Edward T. Ely reports partial paresis of third nerve, in which the patient "complained of confused feeling in right eye which she could not describe—says it began with burning pain in right ear and right side of head; no redness of eye but the pupil was dilated and immovable, and accommodation partially paralyzed; teeth were found decayed and tender." Paresis disappeared entirely in one week after the extraction of a tooth.

Mr. Hutchinson gives an account (in Ophthalmic Hosp. Reports, vol. iv, p. 316) of pain in the eyeballs and forehead—severe at times, but not constant, and with such an intolerance of light that he could not test the power of vision. The patient said she had had no toothache, but on examination of her mouth a carious molar was found which Mr. H. ordered removed. All the symptoms "ceased immediately, tolerance to light returned, the



eye was no longer irritable and a perfect cure soon followed. Prof. J. H. McQuillen mentions a case of neuralgia of the eyeball (*Dental Cosmos*, vol. iv, p. 316.) Dr. P. D. Keyser (*Jour. d'Ophthalmologie*, Tome, i, p. 606), one of inflammation of the cornea. Herman Schmidt (*Archiv. für Ophthalmologie*, xiv 1., p. 107) examined 92 persons suffering from caries of the teeth, to compare the accommodation of the eye on the affected side with the other (or sound side), and also the normal accommodation, and "found only 19 out of the entire number to have normal accommodation power, whilst 73 were decidedly deficit."

I notice in a recent letter from Paris (*Journal American Medical Association*, October 20, 1888,) that Prof. Galezowski, the eminent ophthalmologist, in a late lecture "dwelt on the close correlation between some eye troubles and caries of the upper teeth."

So much for affections of the eyes as a result of dental caries.

There are *other* pathological conditions to which the teeth are liable, that are productive of reflex disorders in the eyes that deserve at least a passing mention. Percy May, M. R. C. S., Eng., cites a case of amaurosis from an unerupted tooth. Tomes says, exostosis (hypercementosis) has resulted in salivation and ptosis; and he also gives Hancock as authority for a report of sudden loss of sight from crowding of the teeth.

Salter too, mentions a case of amaurosis from the same cause; and Tomes again says, photophobia has been observed as a result of alveolar abscesses.

The ears are likewise often affected, and in various ways by diseased teeth, but it will be impracticable to enter into details at this time. Magitot observes that, "partial or total deafness supervenes sometimes, under the influence of caries." And M. Ed. Vautier (*Gazette des Hospitaux*, June, 1860), speaks of deafness resulting from a painful third molar.

Bearing in mind the nervous tract most likely to be involved, and taking the other affections named as analogous, I think quite a number of lesions will suggest themselves as among the possibilities from dental irritation.

There are several varieties of functional disturbance which a careful diagnosis may discover as arising from the emergence ("eruption") of the third molars ("wisdom teeth").

Several cases are on record where hysteria has been induced by this cause, and Dr. Richardson states that he never meets with a

case, "if the excitant seems to be local, without asking in the most solicitous manner after the wisdom teeth." He states that hysteria is more often induced by this cause than is general supposed. It does not appear unreasonable that it *should* be, while it is commonly admitted to be a constitutional hereditary condition, and it is also well known that it can be induced by sickness, insufficient nourishment, uterine and ovarian diseases, &c.

Tomes says that spasmodic closure of the jaws in a slight degree, resulting from the eruption of the wisdom teeth in an already crowded jaw is of very frequent occurrence.

Salter gives details of a case of chronic trismus from impaction of a lower dens sapientia. The patient (a young man aet. 23) had large teeth and a small maxilla, and had suffered for three years with recurrent attacks. The tooth could not be reached, so the second molar was extracted after separating his jaws by mechanical means for a week. The trismus did not recur and all stiffness vanished in four and twenty hours. The same author also reports a case of paralysis of the left arm (the patient a young woman aet. 24) from the same cause. I will not attempt any explanation of the very noticeable fact that so many of the reported cases are said to be on the *left* side.

Odontalgia, or pain that a patient locates in the teeth, is without doubt, often caused by some distant disorder, by some surgical operations, and by accidents in which certain branches of nerves are involved. Brubaker says, "the quotable cases are not so many as where the teeth produce reflex disturbance, but that this fact argues nothing as to the non-existence of a *causal* relation," for "it very often only needs a more precise observation to detect facts that appear almost as if made to support a theory."

He states that he was cognizant of a case in which a lady suffered extremely with tooth-ache for several days, after undergoing a slight operation in the nasal chamber. He says also, that it is well-known that catheterization of the nasal ducts frequently give rise to dental neuralgia—a phenomenon which may be explained by the fact that the nasal duct receives its nerve supply from the branches of the anterior dental nerve.

Galezowski (*Journal d' Ophthalmologie*, tome i, p. 606), is of the opinion that ocular injections and other pathological conditions are as often the cause of dental neuralgia as the reverse.

A case is published in the London *Lancet* (Vol. i, 1859, p. 359),

where a boy had a slate pencil one and three-fourths inches long, driven into the orbit by a fall. It was removed without the use of an anæsthetic, and the bitterest complaint of the patient was that the surgeon was making his teeth ache, the pain being referred to the upper molars.

That toothache frequently occurs during the period of gestation (and that too in teeth which are sound), has long been known. I am not aware that any writer has attempted to give the precise route by which this irritation in the teeth is reflected, but the clinical fact is well established.

From what I have said it would appear that "the several branches of the trigeminus are the most susceptible to dental irritations;" and further, Salter remarks that next to the different elements of the fifth nerve, the branches of the cervical and brachial plexuses are most commonly involved. Pains in the neck, shoulder, acromion process, insertion of the deltoid, bend of the elbow are by no means uncommon; and with them occasionally a loss of motor power, a weary sense of fatigue in the flexor muscles and an inability to grasp firmly with the hand.

"It would really seem that there is occasionally, and in some individuals, a special and exceptional communication between the fifth nerve and those of the arm."

"Reflex nervous irritation dependent upon dental disease is most uncertain and capricious in its manifestation. One person will suffer much from a comparatively slight cause, while in others the same condition more severely developed will produce no such result. There is unquestionably in some persons a neuralgic diathesis; and it is not improbable also, that in some individuals there may be a congenital or induced peculiarity in the centric, or perhaps collateral relations of certain nerves, by which the exalted polarity of one may be passed on and so reflected upon another with exceptional facility. In persons obnoxious to these forms of neuralgia from dental irritation, nothing is so liable to induce an attack as exhaustion or depressed nutrition; and patients will often say that the attacks only come on when they are very tired, or have gone long without food."

In every allusion I have made to reflex action, I have not lost sight of the fact that *pain* is but *one* of the expressions of it, and one that the reader will find less written of than any other, even where the subject is most extensively treated.



Muscular spasm, muscular paralysis, paralysis of some of the nerves of special sense and perverted nutrition are given as the usual manifestations.

An author whom I have already freely quoted, says, "As regards the teeth themselves which excite this exalted nervous irritability, nearly all their diseases appear capable of causing this condition:—

*Caries*, with or without exposure of the pulp.

*Exostosis* (Hypercementosis).

*Nodular developments* of dentine in the pulp cavity.

*Periostitis*, plastic or suppurative.

*Impaction of permanent teeth* in the maxillary bones, and,

*Crowding of teeth* from insufficient room."

I had overlooked these conclusions until after the major portion of this lecture was prepared, but think I have given illustrative cases under every head he mentions.

Whether my presentation of them has been in a manner calculated to instruct, and turned to practical account as an aid in diagnosis in cases that call for critical judgment, is a matter I must leave with you.

Just a few words more and I am done. Dr. Benjamin Rush wrote Nov. 1802, in a letter from which I have already given an extract, "I cannot help thinking but our success in the treatment of all chronic diseases would be much promoted by directing our inquiries into the state of the teeth in sick people, and by advising their extraction in every case in which they are decayed. It is not necessary that they should be attended with pain in order to produce disease; for splinters, tumors and other irritants before mentioned often bring on disease and death, when they give no pain, and are unsuspected as causes of them. The translation of sensation and motion to parts remote from the place where impressions are made, appears in many instances, and seem to depend upon an original law of the animal economy.

Now, excepting his remark in relation to the extraction of *all* "decayed teeth," (for we *have improved* upon *that* practice,) his advice is as definitely pertinent to-day as it was when he penned it. With the additional light which has come to us since his time, coupled with the fact of so many of our profession striving to avail themselves of every help in the treatment of dental and oral disease, I am confident suffering humanity is being, and will be better served through our ministrations.

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## PROCEEDINGS OF SOCIETIES.

## PRESIDENT'S ANNUAL ADDRESS.\*

BY M. W. FOSTER, M. D., D. D. S., BALTIMORE, MARYLAND.

*Mr. President, and Gentlemen of the American Dental Association :*

We are again convened for the purpose of correcting our past errors, for accepting or rejecting new theories presented, for the dissemination of knowledge, for the benefit of our profession, the public and ourselves.

If in this address I may be allowed to cull from the addresses of our predecessors the brightest thoughts, the strongest passages and recommendations contained therein, it would be better than one man's essay—it would be the concensus of the thoughts and experiences of the many. If I make such selections it will be because the language used and thoughts expressed are better than my own.

The importance of the decision of the present meeting on the many subjects to be presented to it is patent. Owing to the great diversity of opinion existing, it should be our aim to proceed cautiously and with calmness.

Among the many subjects to be presented, it has occurred to me that it would be well for this association to formulate a plan of action in reference to making our State dental laws uniform. I would therefore suggest that this body take into serious consideration the advisability of a uniform set of laws regulating the practice of dentistry in all the States. It is perfectly obvious that we are dealing here with a subject of much importance, and upon which a great diversity of opinion exists. The rights and best interests of the public, our profession, the colleges and the newly-graduated student, are all involved. The public welfare, as well as the interests of our profession, demands such a protection as will eventually destroy ignorant charlatanry and free the people from malpractice and indifferent treatment. We are all aware of this. We are all in favor of this, and the colleges and our young gradu-

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\* Read before the American Dental Association, 1890.



ates alike demand such protection. We must admit that our colleges and associations have made dentistry what it is to-day. As in the past so in the future, we must look to those institutions as our best auxiliaries to aid and push forward the progressive work before us.

From a hasty examination and rough analysis of our State statutes, we find that our laws regulating the practice of dentistry in the different States are by no means uniform in their requirements. This is not as it ought to be, and if continued will bring on a conflict between the associations of the several States, which will weaken, if not entirely destroy our national existence as a dental profession.

1. We have laws which demand that both graduates and non-graduates shall be examined by State Boards before admission to practice.

2. We have laws recognizing the diplomas of reputable schools. These permit the holder to practice to the exclusion of all others desiring this privilege.

3. We have laws demanding examinations, but allowing this favor to graduates only.

4. We have laws demanding examinations of dentists, whether graduates or not, with exceptional clauses in favor of the medical degree.

In regard to the first mentioned, that is, laws which examine all alike, whether graduate or not, it would seem at first glance more or less without serious objection. It seems fair to judge an applicant for the privilege of practice by what he knows. But is it fair to place a man who has had no college training on the same platform with one who has enjoyed, at much expense of time and money, this advantage? No medical board that I know of permits this, and if these laws were universally adopted, would it not seriously affect the interests of our colleges, and what would those members of our profession, who have so earnestly advocated the extension of college preparation and training have to say to this, particularly when the colleges, in obedience to their demand and suggestions, have already lengthened their time of preparation from one to three sessions?

Let us look for a moment practically at the working of such a law.

I know that in one of our States, a would-be student of dentistry was advised, as his means were limited, that it would be much better for him to prepare himself at home and go before the Board of Examiners, and thereby save himself much in time and money; that at last if he should go to college and graduate, he would be subjected to the same ordeal. This looks to me like progressing backwards.

In another State the laws of the State Dental Association require that members shall take as pupils to prepare them for college, only those who will remain under their preceptorship two years. This added to the three years required by the colleges would aggregate five years of preparation prior to admission to practice. Under such circumstances do you not believe that the average man would decide to prepare himself at home and let the colleges go? These State laws make no discrimination in regard to previous preparation. If the applicant is twenty-one years of age and can pass his examination, he is permitted to practice.

*Again*, does not this forced examination of our college graduates show to the whole world an implied distrust and want of confidence in our own schools? Even foreign countries recognize some of our college degrees. Under the laws above quoted none are recognized. Is this not a national degradation? And is it not calculated in every way to injure and destroy our own institutions?

2nd. We have laws which recognize the diploma of all reputable schools and allow only such the privilege of practice: these rid of all examinations.

It seems to us that laws like these evidently take the ground that a college training is imperatively necessary to a practitioner, and forbid all other consideration. They do not suppose it even possible that a practitioner can be qualified for practice in the office of a preceptor.

3d. Laws which demand examinations of all graduates, but exclude all others from this privilege.

These laws like the last quoted, concede too that the graduate alone is competent and fit to practice. In this way they aid and encourage the colleges, but they throw a wet blanket on them by publishing to the world that we have not a single college in the United States like Cæsar's wife, above suspicion; no dental diploma which can be trusted and relied on; thereby destroying the

reputation, the prestige and the value of every dental degree in our country.

It does seem proper that the student who has spent so much time and money in procuring his degree should have some protection and exemption from the torture of further examinations. Under these laws there is no respite or relief for him; no matter where he settles, this ordeal awaits him. If he passes his examination in one State, and for reason emigrates to another, the same ordeal of torture is inflicted. I understand perfectly that the response from those favoring these laws, in reply to what I have said, will be, that if the college graduate is not tested by such examinations, the *colleges* would be under no restraint, would cease, possibly, to be so exacting in their requirements, and make, in a great many instances, improper graduations. There is much reason in this. But is a State Board examination any more immaculate in its decisions than are the faculties? Is the State Board less human? Is it more competent? Is it always appointed because of its competency and integrity?

And is there not some way by which this matter can be disposed of alike just to all concerned and interested?

I respectfully urge that this matter be discussed and carefully considered. We ought from the general intelligence of this association to have a plan suggested and adopted that will insure to the public, the profession, the colleges and their graduates justice and reasonable satisfaction, we can then announce to the world that our college degrees, both at home and abroad, deserve the confidence of all.

Further suppose the State Boards in each respective State where a dental college or colleges exist be required with their faculties to conjointly examine thoroughly, both practically and theoretically, all candidates for graduation, and when a student has been subjected to such examination and found worthy and deserving, let the diploma be signed by the president or secretary of the board, together with the faculty, and then let such diploma be accepted in every State of the country. Would there be any reason for one State Board rejecting the work of another? The public and our profession, through its selection of the members of such boards, ought to be satisfied. The colleges would, I think, rejoice in thus being relieved of the responsibility and unpleasant duty of turning down incompetent men, the students would be fairly and thoroughly



examined, and I believe would be satisfied. They do not so much dislike examinations, as they do the repetition of them. Dr. Riggs used to say dentists were like bumble-bees—always biggest when first hatched—and they feel a sense of mortification to be obliged after graduation to submit to an appearance before a State Board of Examiners.

If this association in its wisdom and sense of justice to all, will properly consider these questions, aided, as no doubt it will be, by the National Association of Dental Examiners, I feel confident that we will in time have uniform, acceptable and proper laws on this subject.

I also suggest for your consideration the propriety at this time of petitioning Congress to appoint from our profession to the army and navy of the United States, with suitable rank and pay, a dentist wherever such services are needed.

Congress at this time appears to be in favor of building such a navy as will properly represent our great country. Does any gentleman present think in these progressive days that a ship with her crew, going perhaps on a long cruise is efficiently manned and officered without a representative from our profession on board? Is it not inhumanity to man to send a ship's crew off in such a condition, where nothing is left to the poor unfortunates but to be turned over to the tender mercies of the surgeon, while all he knows of dentistry is the extraction of teeth; and where no one in case of a fractured jaw is capable of applying an interdental splint to relieve the sufferer? We think at this time especially, that the public would enthusiastically endorse and approve such action on the part of Congress. I need not dwell on this subject. Every one of you recognizes the necessity for action in this matter, and the times are we think, ripe for it. Of course in this, as in any effort to effect uniform legislation in the States regarding the practice of dentistry, we should invite the aid and co-operation of the Southern Dental Association and all the State societies.

I suggest also for your consideration the propriety of endorsing and recommending to the proper authorities the use of models taken from impressions of the mouth in the identification of criminals. I think this would be perhaps a very reliable means of identification and these models might furnish a valuable source of study to the ethnologist and physiognomist. In Paris I am told they take impressions of the thumbs and have found this quite a useful means

of identification. You are well aware that but for a set of artificial dentures the remains of the murdered Dr. Parkman could not have been identified. You may also be informed that in one of the most notable murder cases on record (in which an attempt was made to defraud the insurance companies out of a large amount of money) the identification of the remains was by the teeth. A skull was presented in court representing it to be the skull of the missing man who was supposed dead, but who at that time was still alive. It was proved that the supposed deceased had an excellent set of teeth; the skull showed the loss of the anterior teeth and absorption of the sockets. Complications arose making it necessary for those in the plot to murder the man to escape imprisonment themselves. This was accomplished, and having the experience of the former trial in view, an effort was made to knock out the anterior teeth, which was partially successful; the roots and portions remaining showed that it had been of recent occurrence; this with the remaining teeth, were the positive means of the identification of the decomposed body.

I also most earnestly recommend for your consideration and action the establishment of a head quarters, dental museum and library of this association in the capital of our country. There our archives could be kept safely. Such a museum and library would grow very rapidly, and in time become very valuable and redound much to our credit.

We could, by the election and appointment of one of our members resident in Washington, have always at head quarters a permanent officer, who would not only take care of and arrange such museum and library, but who would represent us to foreigners. Our other officers are constantly changing, as are our places of meeting, and a person in a foreign land desiring correspondence with this body, would always know where and to whom to address his communications. I feel confident that the government, if properly approached, would willingly aid in this work—probably furnishing apartments in the Smithsonian Institute. The medical department could give us great assistance, and we would soon have, at little expense to us, something of which we might all feel proud. Probably too, after a short time, the government would offer us through this channel, great advantages in the study of ethnology and microscopy. There are a large number of possibilities depending on this movement. Such an enterprise energeti-

cally carried out would do much to aid us in having members of our profession properly honored by appointments to the army and navy. It would serve to convince congressmen that there was more in dentistry than perhaps they had before imagined or dreamed of. There are a large number of possibilities depending on this movement, and I would advise the appointment of a committee to examine into the probable value and success of such an undertaking, and if favorably considered, to report at our next meeting a plan for carrying the same into effect.

Of course we cannot expect to accomplish in a short time all that may accrue in the future. The question of preparatory dental education has been discussed in our associations, both orally and in writing, by leading men in our profession, and yet it is not solved as to the better method. There are many in the profession who advocate a higher education than that usually required of the applicant for admission to our schools. This prevents some men of natural capacity from becoming members of our profession. There are many who consider a good English education sufficient. The colleges have agreed to an increase in the length of the sessions and preliminary examinations, and have endeavored to meet a demand for the more thorough preparation of students before granting a diploma. This course was adopted by them because this association recommended it, as in its judgment necessary.

Does this increase of time bring about the desired reform? Are not some men by educational advantages and manual dexterity more competent or better fitted to practice our profession than others with less qualifications? Is there not a great truth in the language of Professor Huxley, "Handicap by time one man to the capacity of another." ? The more liberal the general education, the broader and more liberal are the views of the possessor; and from this standpoint such a one might reflect more credit on our profession than one of less accomplishments. The natural endowments and aptitude of the less educated man in a final examination would prove that other qualities fit him also for our profession. From this standpoint a dental education commences when the person commences the study of dentistry, whether it be in the office of a preceptor or in some reputable school. This general education either qualifies him for this, or it does not. This is plain, I think. Then is it not a question of *qualification* after all, whether it be one, or five years, or original capacity?



The thirtieth annual meeting of this Association gives renewed assurance to the public and to the profession that as in the past, so in the future, it will be ever watchful to guard with jealous care the best interests of both. By its suggestions and adopted resolutions it has exercised an influence that is far reaching and beneficial in the highest degree. It has been largely instrumental in giving and encouraging a higher standard of dental literature. It has in its membership men who have earnestly and faithfully given their best energies for the promulgation of the broader principles which underlie our profession, the recognition of which has elevated it in public esteem and ranked it, as the talent and ability displayed deserved to rank it, among the most honored in the public service.

Many bright lights have been called from labor to reward. They have left with us their spirit and their record. Let us emulate their example and demand from ourselves such earnest work and dignity of character as will command from an intelligent public that further recognition which our profession so justly merits. Here is no room for selfish ambition or personal aggrandizement or self seeking. He that would be chief among you, as the All Wise once said to His disciples, "Let him be as he that doth serve." To rank dental science among the benefactions of mankind should be our absorbing desire.

Accord me, gentlemen, your forbearance and assistance in the discharge of my official duties to this Association.

## SECTION II.

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### DENTAL EDUCATION, LITERATURE AND NOMENCLATURE.

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BY C. N. PEIRCE, D. D. S., PHILADELPHIA, PA.

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The Section on Dental Education, Literature and Nomenclature begs leave to offer the following as its annual report :

Since the formation of this association, in 1859, the profession has maintained a steady growth in the subjects embraced in section *two*, and especially has this been noticeable on matters pertaining to education.

The number of dental colleges at the time of the last annual report was thirty-one. This number was decreased during the year by the suspension of the dental department of the St. Louis College of Physicians and Surgeons, but increased by the establishment of the dental department of Tennessee Medical College, at Knoxville, Tenn., the Western Dental College, at Kansas City, Mo., and the U. S. Dental College, at Chicago. The number of dental colleges in active operation at the present time being thirty-three.

At the commencements held\* since the last meeting of this association, from twenty-nine of these colleges there were graduated nine hundred and sixty-three persons, an increase of one hundred and sixty-seven over the preceding year. The ratio of increase in the number of graduates this year is three times as great as it was last year over the year preceding it.

The total number of graduates during the past years (1886-1890 inclusive) is three thousand six hundred and five.

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\* No report was received from the Northwestern College of Dental Surgery and the National University (2), while the Western Dental College and the Dental Department of Tennessee Medical College have held no commencement (2). Total 4.

The rapid multiplication of dental schools in the United States involves a question which is menacing the future prosperity of the dental profession. The results in all probability will be similar to the results attained by the medical schools of this country, who turn out annually, to prey on an unsuspecting public, a number of men which largely exceeds the number of graduates in Great Britain, France, Germany, Italy and Austria combined. This has been carried to such an extent that the medical graduate is the laughing-stock of his trans-atlantic confrère. He now swarms in such numbers in the United States that one out of every six hundred is a medical graduate. At the present rate of progress made by the dental schools of the United States, they will soon equal, in fertility, at least, the medical colleges of this country.

While eventually the subject of education will probably be under national control, at the present time some means ought to be adopted whereby the rapid increase of so-called colleges might be checked. Possibly the only remedy at present lies in the amendment of State constitutions, so that at least none but "reputable and capable" men may be able to secure articles of incorporation. In one State the incorporation of dental colleges and infirmaries is almost co-equal with the issuance of dog licenses. The section is not prepared to offer any special remedy, but hopes that members of the association may reflect on the question and be prepared to adopt some means to check the evil before its serious consequences become more marked. To one subject the section would direct attention. There is to-day, in the literary and scientific elements of society, an effort being made to establish a National University at Washington, D. C. As that idea matures, which will probably be in the not-far-distant future, those interested in the progress of dentistry should be on the alert and see that our profession is there represented.

The advantages offered for the establishment of such an institution in the capital of our country are too patent to be overlooked. First the climate for eight months in the year is hardly surpassed in our borders. It is the home of men of talent—students of profound and varied ability and of institutions such as the Smithsonian National Museum, Government Surveys and Commissioners, American Medical Museum, Philosophical societies, National geographical, agricultural and chemical libraries embracing over



1,000,000 volumes, and laboratories embracing illustrative material in every department of medicine and surgery.

With anxiety and interest every earnest member of the dental profession is looking to the action of the "National Association of Dental College Faculties." The adoption last year by that body of a resolution requiring all schools connected therewith to adopt a three years graded course of not less than five months for the session of 1891 and '92, to be continued thereafter by all such schools, was certainly a forward step, which, it is to be hoped, will be fruitful of much good. That this step shall be maintained, so that the profession may reap the benefit of this united and progressive action, depends largely upon the State Boards of Dental Examiners and the encouragement they receive from the National Board of Examiners. It is an easy matter for schools to obtain representatives in the Association of Dental Faculties, and advertise in their announcement that their requirements are consistent and in accord with said Association, and subsequently in the admission and graduation of students to ignore every vital principle therein involved. The State Examining Boards are the only power capable of correcting this malfeasance, and unless they are willing to exercise this power the resolutions proclaiming this advance in educational institutions are but blots upon their books, and as worthless as a discarded garment. It is well known that a prominent school has so advertised its accord with the association of faculties and at the same time has violated the latter's requirements when a few students were to be gained thereby, and yet their diplomas have been endorsed as freely as those from schools where every letter has been conscientiously adhered to.

Since the last meeting of this body two States have so modified their dental law as to require an examination and endorsement of all who propose to practice within their borders or commonwealth without regard to where the graduate's diploma or certificate was acquired. Massachusetts and New Jersey are the States which have taken this step which your chairman of the section believes is in the right direction. State Boards of Examiners share with the faculties an important responsibility, and such action on their part must prove a great incentive to students to be thorough and well-grounded in principles and practice. Of course the value of this State Board examination as well as its justice, depends upon the qualifications of those conducting it. It is not enough that the

members of this board of examiners enjoy the emoluments of a large and remunerative practice, or that they be held in good repute by their neighbors, and have the degree of D. D. S. previously obtained from some college. Any one or indeed all of these are not necessarily qualifications for the proper performance of such a function. The qualifications of the State *critic* or *examiner* must depend upon judgment. This judgment must be ripened or trained through what may be termed first hand knowledge, knowledge the result of practical experience and experimentation.

One with a very limited experience may judge of the density and finish of a filling or a piece of prosthetic dentistry, but may be very poorly qualified to criticise the appropriateness of the one or adaptation of the other. An eminent professor has said "Our knowledge of the universe depends upon our contact with it, and may be expressed in what we call science." So one's knowledge of dentistry depends not only on his familiarity with the materials used, but also on the knowledge possessed of the tissues or organs upon which the operations are performed. So just in proportion to the extent of this knowledge gained from contact, is the knowledge of the science of dentistry broad or narrow.

If it was only practical skill, or skill in technique that was required, the student need not go beyond the preceptor's office and laboratory; but fortunately our colleges are instituted for a deeper and broader purpose. The forces of nature as embraced in biology, chemistry, metallurgy, etc., etc., should be and are taught in our best schools as much as a matter of necessity in the dental schools.

*The last paragraph on page 666 should read as follows:*

Since the last meeting of this body, three States, Mississippi, New Jersey and Minnesota, have so modified their dental laws as to require an examination and endorsement of all who propose to practice within their borders or commonwealths, without regard to where the graduates' diplomas or certificates were acquired. Massachusetts had three years previously passed such a law, thereby inaugurating a step which your chairman of the section believes to be in the right direction.

C. N. PEIRCE, *Chairman Section II.*

ture or eutopian ; but at the present time the same ideas are accepted by the section as worthy of voice and are as follows :

In view of the fact that a very large proportion of our dental schools are dependent upon the class in attendance for support, and that the compensation to professors and demonstrators has a like sustenance, the temptation is constantly to increase the class beyond capacity for instruction, and to estimate its value by numbers rather than quality. To such an extent has this been true in the desire to excell by publishing a large graduating class, that a prominent school some two or three years since graduated the same five students two successive years. To express the condition of our educational institutions tersely and in a few words—we should say, that under the present organization of a very large majority of our schools, the tendency or temptation is to insufficiency rather than proficiency, to superficiality rather than solidity. Therefore we deem it an imperative necessity for growth and proficiency that there should be established a higher standard than is now required by any of our dental or medico-dental schools. And that this Association now in session should before adjournment appoint a committee of five to consider the advisability of establishing a National Board who would be clothed with power to confer a title or degree upon those members of our profession who had attained a well rounded degree of proficiency by experimental and true scientific work to make them worthy of such distinction. The object or purpose of this action would be toward a broader, a more liberal education in everything that pertains to the profession of dentistry.

At the last annual meeting the following resolution was adopted:

*Resolved*, That Section II. be instructed to formulate and present at the next meeting of this association a plan of work for the sections of the association.

Many of the members of this association are not satisfied with the method now in vogue of doing the work of the association, and the resolution was adopted, in all probability, for the purpose of having some means devised whereby the annual labors of the association may be made more valuable.

An attempt was made by the secretary to secure reports of the meetings of the various State and local societies, to get abstracts of the papers read before them and of the discussions following. The secretary issued the following circular-letter to secretaries of societies :



## TO SECRETARIES OF DENTAL SOCIETIES IN THE UNITED STATES.

A plan under which the work of the various sections of the American Dental Association should be done is being elaborated by the section to which this subject was referred at the last meeting of the association. The secretaries of the various dental societies are requested to prepare (or have some competent member of the society do so) a brief, concise synopsis of the work of the society. This should include extracts from the papers read and from the discussions following, and should include mention of every item of scientific value brought forward during the meeting of the respective societies, a description of new instruments, appliances, and in fact a mention of *everything* worthy of notice. These reports should be sent as soon as possible after the adjournment of the meeting of the respective societies, to the secretary of Section II, A. D. A. (Louis Ottofy, 70 Dearborn street, Chicago). They will then be separated and sent to the respective chairmen of the various sections. In this way the chairman of each section will receive a report of everything that has been accomplished by the different societies of the United States in the particular branch represented by his section. The sections will then prepare their reports from these State and local reports and thus present an entire exhibit of the profession's advance and labor during the year. The societies which contribute to the accomplishment of this object will receive due credit in the report of each section.

Please forward at once to the undersigned any papers, or essays, or abstracts of them, read during the past year, for the purpose herein mentioned.

Credit will be given your organization for the work done during the year.

Address all communications to

LOUIS OTTOFY, *Secy. Sec. II, A. D. A.*,  
70 Dearborn Street, Chicago.

The intention was to secure the scientific reports to distribute to the respective sections of this association in order that they might present whatever they found worthy in their report to this association. But few replies were received. This led to an inquiry regarding the American Dental Association, and the relation which it bears to the dental societies and the profession generally.

The investigation disclosed the following facts:

1. That the American Dental Association is not a truly representative body of the profession.
2. That its membership is too small to accomplish what it should.
3. That every dental society ought to be represented by one or more delegates, and that these delegates should bring to it a report of the entire work of their societies during the preceding year, and thus cause the reports of these sections to contain a perfect epitome of the entire scientific doings of the profession in the United States.

In securing a list of members of all dental societies in the United States, we find that there are not less than ninety nor more

than one hundred dental societies—strictly speaking and excluding alumni and other kindred organizations—in the United States. Every State, except Montana, Nevada, Oregon and Washington, has a State society, and near all of them one or more local societies. The District of Columbia has two dental societies. None of the eight territories has any dental society.

The approximate aggregate of membership in these ninety odd societies is between three thousand and three thousand five hundred. These societies are classed as national, semi-national, interstate, State, local, county and city societies. This certainly large membership was represented last year in this association by only thirty-eight delegates who represented twenty-two societies which are located in twelve States, and the District of Columbia. The dentists of eighteen States and eight territories were not even represented in the membership of the association by any one. Three States contribute 75 members, while the remaining twenty-three States contribute only 100 members. It will also be noted that with the exception of twenty-three who may be credited to the West, two to the Northwest, and fourteen who are from the South the association is made up of 136 dentists from the Eastern States, making it appear more local than national.

This condition ought not to be tolerated. The strength and power of the association must come from unity. Some means should be adopted whereby the membership of the association may be increased to at least one thousand. An invitation or an appeal ought to be issued to every society to send delegates to the meetings of this association, even if it shall be necessary for the local societies to pay fair compensation to their representative. When this can be accomplished the section would recommend the following method of work to the sections:

Each section should appoint some one of its members, or delegate some one to attend the meetings of dental societies, and make reports of their proceedings, report important clinics, note new appliances and methods and make a report to their respective sections, or make one entire report to be divided and each section to be given those parts relating to its own special work. In addition to these reports, abstracts of papers published in various journals should be made. The sections then ought to sift out the chaff and present to the association a summary of everything that has occurred affecting dental science in any way, direct or collateral.

The length of this report makes it impossible to present much in relation to dental literature. Among the most prominent of works published during the year is a treatise on the irregularities of the teeth and their correction, designed for practitioners and students, by John N. Farrar, M. D., D. D. S., of New York City. This publication when complete will be one of the most remarkable and creditable productions which the present decade has witnessed. It will consist of three volumes—divided for the convenience of the student into several parts.

The first volume deals with the history and etiology of the subject; the basal principles of regulation; nomenclature; principles of construction of apparatus; retaining devices; laboratory rules for manufacturing devices; application of force; eruption; antagonism; interdental spaces and the correction of irregularities by grinding, and by extraction.

The second volume contains the classification of irregularities and the various methods of their treatment; such as straightening teeth to line; turning and elevating teeth; widening and enlarging the dental arch, and the correction of protruding teeth.

The third volume is largely pictorial—being an object index of all mechanisms described in the other volumes. While in volume two, the order is governed by the locality and kind of operations, in volume three classification is made according to the principles upon which each mechanism is constructed. Those acting by *springs*, or *gradual*, in one class, and those by *screws*, or positive, in the other.

The author of this publication has been at an expense of nearly (7,000) seven thousand dollars in the production of upwards of two thousand (2,000) engravings.

The first volume will be complete for the purchaser by October first; the second and third will soon follow as the material is now all in the hands of the publisher.

There is nothing to report on dental nomenclature save a paper noted from Dr. W. H. Atkinson. The section recognize that little can be accomplished upon this subject save it is considered by some international organization.

The section presents for your consideration the following papers: "Dental Education, Nomenclature and Terminology," by W. H. Atkinson of N. Y. City. "Scientific Instruction in our Colleges," by A. H. Thompson of Topeka, Kas. "Dental Education," by C. B. Atkinson of N. Y. City. "National Dental Education," by R. Ottolengui of N. Y. City.



## EDUCATION, NOMENCLATURE AND TERMINOLOGY.

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BY WM. H. ATKINSON, M. D., D. D. S., NEW YORK, N. Y.

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Anything like demonstrative presentment of education, nomenclature and terminology requires an extent of study, labor and statement quite beyond the capacity of any individual to present within the limits accorded to a single section of an Association, composed of eight distinct sections and limited to four days of elaboration, presentment and adjustment.

The term itself, education, signifies to draw out of the storehouse of the mind the excerpts of canceled values of the various stages of mental activity operated in consciousness, from the sense of deficiency, to the sense of fullness of the mental receptacles of the values of all the minor propositions, as bases of the demonstrations capable of being formulated and held in consciousness, ready for use in the efforts to communicate in a satisfactory manner the mental processes through which they have been acquired. This involves a comprehension of the work in the progress of its growth, to the completion of the wording representing the stages of mentation through which we are carried to attain a full understanding of the processes, so that they may be recorded as knowledge, to be applied to teaching, or any of the exercises pertaining to the rectification of irregularity, however induced, in the understanding and the execution or practicalization of the knowledge pertaining to the healing of mind and body.

The naming of these stages would properly be the work of nomenclature, or the classification of the names of things and the changes resultant upon their association and disassociation everywhere presented in planetary existence, involving mineralistic, vegetablistic, animalistic and humanistic modes of combination and disruption and progressive building of the bodies capable of function.

The technique of recording all these various mutations involves the proper arrangement of terms, which are the elements in *terminology*, upon which correct classification depends.

The greatest obstacle in the way of the teacher is the assumption of finality that has been practiced in the past, requiring the learner to refer and defer to the recorded statements in the earlier and unripe states of the records that have been called the only measure of scientific certitude: and I know of no way of getting rid of these dead weights, so successful as depending upon the environment, in part and in whole, as the source of the inspiration, that coming in serial order, satisfies the unrest of the mind of the inquirer. In fact, when we have said "in the whole" we have left, unconsciously, an open door for something to be added to it in the progress of our investigations of any subject engaging the mind. By thus saying, I do not mean to ignore the potency of memorized trends of thought, but I do mean to advocate the necessity of keeping in touch with the present luminosity and perspicacity of the conjoined illumination of learners and teachers throughout the whole range of most massive and most minute research.

Philosophy, the love of wisdom, is an example of obstruction, by assuming it as the ultimate of all acquisition; whereas echosophy, or the possession of wisdom, is that which we seek instinctively and serially, but have not dared to jump out of the old rut and say so plainly.

The particular instance that comes to my mind now as specially obstructive to our progress in the investigation of function is the attributing of the power which operates the function to the body in which the changes occur. For instance, it is said that the liver secretes bile, which is not true. Bile is secreted in the liver, by a process not yet demonstratively formulated. Probably the greatest mistake is in saying, give me the measure of phosphorous on a planet and I will give you the amount of mental activity possible to that planet; which is often formulated in a modification of this statement by saying the brain secretes thought; where no brain is there is lack of mental action, and similar statements. All such naturalists fail to see that the power is before and in all its manifestations; the justification of which has already been stated in this paper, viz: The physiology of the mineral kingdom is crystallization, that of the vegetable kingdom is cellulation, and that of the

animal kingdom corpusculatation. All these are operated under the behest and by the energy of the typical endowment of light and plus.

A friend asks, what is the significance of the skin? and probably had little conception of the grand reach of the significance of such a query. The skin is the involucre of individualities, and hence is predicable of the minutest corpuscle and the voluminous aggregations of the same which limits tissues, organs and systems. Take a piece of human skin and study it minutely and it will be found to consist of an outer surface and an attached surface to the body of the organs constituting the system. Our survey will not be complete if we do not include the inner skin, or mucous membrane, constructed of very similar elements, and so nearly alike in endowment that they may readily, vicariously perform the function of each under stress of necessity.

The principal function of the skin and the mucous membrane is depurative; that is to say, the throwing out of excess of pabulum, effete matter and debris resultant upon functional activity of the underlying organs. The mucous membrane normally absorbs nutrient material when reduced to the character of a perfect peptone, and under certain circumstances the skin may in a minor degree do the same when immersed in a solution in which perfect peptones abound.

All this and more, has to be stored in the mind, either in implicit or explicit condition, to enable us to avail ourselves of the best possible modes of education. The stored mental energies of ancestry is one measure of individual endowment which, like the organs of the body, are built after the type of converging and diverging impacts of maternal and paternal experiences in the line of longevity, activity or sluggishness of the individuals composing the line. This hereditary endowment of past molecular experiences and affectional activities of ancestry lays the foundation by involution of the possibilities of evolution, of which so much is made in these days of scientific inquiry as to the origin and development of genera, species, varieties and sportive differences.

I have seen children, for whose mothers I performed the function of obstetrician, whom I recognized as belonging to the family by their manner of locomotion when I only saw their backs; and if in one man's experience of a short career there shall be a multiplicity of examples pointing to this doctrine, it will not be deemed hallucination or dementia to state that the agreements and dis-



agreements, the love pats and the quarrels indulged in by the parents are visited upon their children, as the Scripture says, to the third and fourth generation. Then let those teachers who love their calling and their pupils take courage and go forward, in full faith that the inspiration of the Almighty which giveth man understanding will ever be present to illuminate and lead in ways convenient those for whom our best affections go out, with yearning desire for their enlargement and completion in the line of investigation before them.

Had we all the record of all the past condensed into a single syllabus of one paragraph, we would be minus of the accomplishment of our desire to lead our progeny into fuller appreciation and understanding of the problems of life; for were this the case we could only depend upon the recorded inspirations and elaborations of our predecessors, and be shut out of the luminosity of present enlightenment coming to us through the increased facility of revelation and invention of the time.

I need only to say that before the days of telegraphy, stenography and phonography the terminology belonging to these departments would be a dead letter to all those who had not kept in touch with the advancement of events.

Education, to be legitimately exercised in these days, must transcend any legitimate interpretation of the philology belonging to this classification. It is much more difficult to unlearn earnestly adopted doctrines than to accept even difficult problems of new presentment contradictory to and demonstrative of the falsity of the claim of finality that has hitherto held the field in the adoption of terminology, which lies at the basis of all our nomenclature.

Just here allow me to say that I was not in accord with the vote adopting the classification method from The American Medical Association in this body; and although my then inspirational position was held in abeyance out of respect for the vote of the majority, I now wish to emphasize the importance of depending upon present illumination rather than musty records of that which is not up to the status of present development.

The older members of this body will remember that I have complained repeatedly that we have not yet attained, in our mode of work, to a higher status than that of a mere convention, and that we had no syllabus of classification that should sufficiently lay out different lines of work, to enable us to accomplish the work of each

section as a separate but related exercise; so that we need not have too much iteration and reiteration of the ground and doctrine properly belonging to each section as designated by its specific name. If we are to have the coming times distinctly in advance upon the already effete teachings we must be awake to something better than the long didactic preachments that so tenaciously hold the field in church and state and in professional and societary convocations.

Does any one ask how this shall be done? The reply is: "The word is nigh thee, even in thy mouth, to do with thy might the work that thou undertakest," for the good it may be to others independently of its reflex upon the ego. In other words, to esteem our life work as a mission committed to our charge for the good of all; and, being governed by the opportunities of the time, demonstrate anything that we may suppose to be in advance, that the adjudication and legitimate criticism of the whole may be brought to bear upon the subject, and thus bring it to a settlement and a formulation of such perspicacity as to meet the demands of the coming times.

This gives me the opportunity to say that the effort was made in the reports of nine successive years to arrive at something that should be really foundational; but it met with little appreciation, and direct personal opposition by the very good men who esteemed themselves the *creme de la creme* of the organization, but who were as deficient as babes in the comprehension of the grasp of the subject in its breadth and its details. A vote of the body at the Highland House in Cincinnati was carried at the instigation of a man who was really earnest, and assumed a perception of finalities entirely beyond anything claimed in this series of reports, but said that they could not be made useful to this body, nor to the world, by reason of the difference of view of what has been and what is and what may be hoped for. I say this as a sort of salvo to my scourged conscience for having, like a coward, drawn back and allowed the clouds of darkness to overshadow the body as they have until this day. I am aware that this is speaking in general terms, but I esteem them as foundational and essential to the completeness and usefulness of the reports that may be vouchsafed us by fresh and vigorous blood being integrated into the organization of this section.

## SCIENTIFIC INSTRUCTION IN OUR COLLEGES.

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BY A. H. THOMPSON, D. D. S., TOPEKA, KAN.

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That scientific education, *i. e.*, pure science and scientific methods, is in great danger in our colleges, there is little doubt. The signs of the times cause its friends great anxiety. The practical man is abroad and his crusade against everything that does not promise a visible return in revenue is beginning to make itself felt even within the sacred precincts of our halls of learning. He has crossed the threshold of our professional educational system and has instilled a contempt for learning and pure science into the minds of students, so that their ambition is not for a high standard of attainments, but for the mere certificate of an education, and the learning of the mere methods of performing operations, that they may hasten on to the period of money making. The student's instincts are entirely commercial, and the value he places upon all instruction depends upon its bearing upon paying operations. He is practical and takes his cue from the omnipresent practical man, who decries pure science as the pastime of cranks, or at best as an amusement of the curious. Our pure science is in danger from these men, who look upon it as expensive and useless, and wasteful of the student's time. They would have it reduced on our college curriculum, and its place filled with clinical and practical instruction.

The plea of this paper is for the preservation and extension of the purely scientific part of our curricula, for the planting and nurturing of that culture in pure science which shall insure height and breadth and depth of mind, that the student may be more of a thinking man and less of an operating machine. We would that he should have the strength and joy that comes from culture and enthusiasm; that he would love science for its own sake; that he would give the first place in his mind to



a knowledge of the basal principles in their scientific purity, and that he would love learning for its ennobling powers, and not merely for the return it may make in money. It is this debasing estimate of knowledge and all attainments that is crushing the nobler mind-life out of the people of our day, the estimate that reduces everything to a materialistic consideration. The Nemesis of materialism broods over our land like a death-damp, poisoning all desires for a higher life, paralyzing noble impulses, weaving its deadly spell into the hearts and lives of our hopeful and enthusiastic youth, leading them away captive. This beastial materialism has polluted and debased science and prostituted it to the ignoble ends of money getting. It is against this low estimate of the higher things of life—or the money estimate of our higher education—that we enter protest. We would that our science should be upheld because it is science and because it is ennobling and elevating and because it is the basis of all our knowledge and practice.

It is true of course that this cry against sordid and earthly minds and grasping men, who live only to make money, and estimate everything at its money value, is as old as the race. The ancient classical writers bemoan the degeneracy of their age—that that men should prefer gold and riches to mental culture and the treasures of the soul. It is also true that the practical man has always raised his voice in our professional councils against mere science and abstract learning, and demanded a modification of our studies that it should be more “practical,” *i. e.*, with more reference to methods of operating, more artisan and industrial, with the exclusion of the things that do not bear directly upon practice. It is also true that in spite of all opposition and in spite of the perennial crusade of the practical men, that pure science has advanced—irregularly it is true—and carried forward our education. But it is also true that the practical man and the practical idea are still powerful, and still drag upon the wheels of scientific progress. It obstructs the highest purposes of science and culture and the pursuit of learning for its own sake, and substitutes as the end of learning the power of mere money-making, which it may confer. And the worst of it is that there are few minds in this practical, materialistic age that can grasp any other estimate of life. The creed of the religion of money-making, *i. e.*, “the chief end of man is to get money,” is in the very air we breathe. We cannot wonder that our young people are polluted by it, and that they grow up to care for

nothing else. It is a heartless, pitiless slavery. But the few who by temperament, acquirements or experience have escaped this thrall-dom, know full well the disappointment of mere riches, and the joy there is in higher things. They know that the things of real worth, the culture which lifts men and ennobles their minds, are not of the earth, and are not to be estimated by a money value. Pure science, abstract science, theoretical science, if you will, should be cultivated in our schools, not only for the ultimate importance it bears to practice as its basis, but for its mental and ethical value to the student. It will lift him to a realm unknown in his sordid, practical life, and make him the friend and companion of heroes. He will be brought into touch with the master spirits of the ages, and in our own field with those who have made our sciences and carried forward the banner of progress.

And yet we would not detract from the value of practical training in our schools. Its importance is so apparent that it could not be ignored if we would. We would not be ungracious to the memory of the Varneys or the Webbs, who have gone before, or to the host of the living artistic operators who by their high skill have raised the standard of operative dentistry. On the contrary we glory in the honor which they reflect on the profession. These are nature's noblemen and they wrought with their might for the advancement of operative dentistry, and they deserve all honor. Artistic operating has won its way and carried all before it—and that is well. We would attain the highest artistic perfection possible. The momentum is so strong in this direction that it will take care of itself. But, it is not necessary to the success of the artistic branch of our education that the scientific part should be pushed aside as cumbersome and useless. It is not necessary that pure science should be neglected, that applied science should succeed. It is not necessary that science should be banished, science which is the basis of practice, that practice should be better taught. It is not necessary to reject the fundamental principles, that all the time and energy of the student may be given to the superstructure of practice. It is not necessary to banish all knowledge that all effort may be given to action. In fact these propositions bear their proof upon the face. The basis of action is knowledge—the basis of practice is science. Without pure science we cannot have advanced practice.

If it were true that practical education were the main thing, the only thing worth considering, as the practical man would have us believe, it were better to return to the old system of office apprenticeship. No time was wasted on theory or science in that system and the student had no end of practical experience. As a practical education it supplied numerous advantages over the college system. The student was untrammelled by books and lectures and went in for a practical education—and that as quickly as possible. Its brevity was its main recommendation. Why then should the practical man wish to degrade our college system by abolishing the scientific features that make it a college, and reducing it to an industrial school? It would be better to return to the old office system at once, which is the practical system in perfection. The college system of to-day is the embodied protest of the profession against the old office apprentice system. It originated in response to a demand for a higher education. Its main feature is to teach young men entering the profession the scientific principles which underlie practice, and in addition, give clinical instruction in the best methods of practice. It is the scientific and industrial education combined.

But we must not lose sight of the fact, the main fact, that education in the basal sciences, scientific instruction, is the main feature, the important factor, of college education. Scientific knowledge of the underlying principles is the main, the primary structure, the foundation; the superstructure of practice is built upon and depends on it, and is secondary. The primary principles are permanent and unvariable—the superstructure of practice is variable and transitory. Practice is subject to alteration and changes as new methods, new inventions or appliances appear, and methods vary from year to year, but the foundation sciences are stable and changeless. Is it not essential then that a knowledge of these sciences should be thorough and that the student should be well grounded in the great principles?

And then again, practice is science applied and materialized. Science has made practice possible. Without knowledge of the qualities of things, we could not have accomplished what we have in practice. Therefore science is a practical thing. Modern civilization is the product of science—it is thought materialized. It differs from ancient civilization in that man has conquered more of nature and made it more tributary to his wants. The accumulated



knowledge of the centuries is his storehouse. The savage man thinks but little, he knows but little, he can do but little. Like the animals around him he is but an automaton and acts by force and not by thought. He is practical. He is not hampered by theories or science or the effort or products of thought. The civilized man acts and lives by thought and not by force. By thought he subdues forces and makes them serve him. By thought he wrings secrets from nature and applies them to his uses. By thought he sounds the mysteries of chemical and physical activity, and brings therefrom substances and powers which enable him to annihilate distance and matter and defy disease. By thought he forces unwilling nature to minister to him in countless ways, and it is the knowledge of things, it is pure science, which enables him to do this. Is it not folly, is it not absurd, then, to ignore the importance of the teaching of pure science in our schools, or to curtail it in any department?

It is apparent to all that we are entering upon a new era in dental education, and in the revolution that is upon us, the friends of pure science must be vigilant that its study is not molested by the iconoclastic wave of practicalism and the craze for mere money making that is sweeping over us. We must see to it that the position its importance warrants and demands, is maintained, and that it is given the attention it should have that students may receive the full benefits of science teaching in all its bearings. To that end one of the first conditions is that of methods of teaching. In this connection we notice that when the three years course becomes general, it will necessitate a graded course of study.

This method is scientific and will be productive of good results. It will check the rude haste and rush with which students try to get through college, and will lead to deeper learning by reason of greater leisure for study. In such a course the first year will be largely class-room work, and catechetical teaching will be its principal feature. This will be a sort of primary work and all will agree that new students are much in need of such a department. The main cause of the lowering of the standard under the recent college system, was that the teaching had to be brought down to a very low level to be rendered comprehensible to the minds of men unaccustomed to study. And the worst of it was that the standard had to be kept low to allow of completion of the course in a brief time. In the three years course this necessity will be obviated, for the

student will have ample time to learn to study and to acquire knowledge also. The first year of class work and catechetical instruction will prepare him for study and perhaps lay the first layer of the foundation ; the next should be a combination of the classroom system and didactic lectures. By this time the student will have learned to study and can proceed rapidly in the acquisition of knowledge. The last year should be entirely didactic—with regular examinations, of course—as becoming advanced students and the dignity of the cultured gentleman whom we would then have before us. Simplification in the first year, precision in the second year and amplification in the third year, should be the keynote of the three years course. But will the colleges do this, or will they devote more time to the clinical department and make it the main thing? With the tendency to practical teaching, there is danger of this, but it would be a great mistake to subordinate the fundamentals to the secondary branches.

A crying need of the present time is for better text-books, and for the graded course they will become a necessity. There is no doubt but that the present ponderous text-books, clumsy and unwieldy as they are, are totally unfitted for the use of students. They are padded with obsolete and oft-times erroneous matter, and do not keep up with scientific discovery and progress. What we require is a series of graded monographs on all branches and parts of branches. The primary books should be brief, plain and simple for the first year. For the second year broad, careful and exact, and for the third year thorough, deep and comprehensive. The principles must first be laid down carefully and the student led gradually up to the acquisition of the highest science and the highest culture of mind and hand.

A great fault with college teaching has been the inexperience of teachers *as* teachers. They are unused to teaching as a special work—are not professional teachers trained for the duties of imparting knowledge. For a busy practitioner to rush from his chair to the lecture room and hurriedly fill his hour by an illy-prepared lecture, when his body is weary, his mind pre-occupied and his interest in the work at a low ebb, is not good teaching. For a practitioner to be a good teacher is a mere stroke of natural genius, not of training. We need teachers who shall give their lives to the work with inborn and developed special fitness for it ; who shall have

leisure to study and investigate. Such a corps of men will do our colleges honor, and such men alone can do the work well.

The standard of admission should be extended so as to include not only a good general education, but also some elementary knowledge, at least, of chemistry, physics, anatomy and physiology, so that so much of the time of our teachers need not be occupied in teaching the beginnings of these sciences, as is now the case. We hear much of manual training nowadays, and it should undoubtedly be made a necessary part of the student's dental education; but as has been well said, it is the fitting school that should train the student in manual manipulation, artistic principles, knowledge of materials and the working of them. These things belong to the primary schools and primary training, and should not encumber the collegiate course. Then again there is danger in this manual training fad, and there is something to be said on both sides. If the training is to be bestowed upon boys in preparatory schools with a view to developing muscular strength, skill and precision of movement of the hand, well and good. But if it is to intrude into our college curricula to make athletes, blacksmiths and mere artisans at the expense and by the neglect of scientific culture and intellectual development, we had better have none of it. We cannot afford the sacrifice. Manual training at the expense of scientific culture, would be ruin. The proper cultivation and development of both is what we all desire of course, but the danger must be kept in sight.

A new and curious factor of dental education has arisen recently in the matter of the examination of graduates of colleges by State Boards, before being allowed to practice. The immediate result of this movement appears to be a conflict between the boards and the colleges, in which the latter are likely to get the worst of it. That the State Boards, by the laws licensing practice, will mould the education of the future, there is little doubt. What these examinations dictate will necessarily become the education of the colleges, and it requires no ghost from the grave to tell us that those examinations will be largely practical. The boards will be made up of men from the ranks of practicing dentists, who are practical men by necessity, and rarely students by inclination, and the sciences in their examinations will be neglected. Right here we raise a warning cry to the State Boards, pleading that they combat this tendency to the elevation of the practical over the scientific in their examina-



tions. If they are not prepared to examine in the scientific branches, they should prepare for it, or employ specialists to conduct such examinations for them. To lower scientific education is to sound the death knell of progress in the profession. They must not give undue prominence to practice, which is secondary, and neglect the scientific branches, the primary basis. To do this is to retrograde and lower our education, for the colleges will be bound to follow where the boards lead. The boards are vested with supreme power and from them there is no appeal. Therefore their responsibilities are great and they must consider carefully and act wisely. They are the custodians of our professional education and progress, and with them rests the standards of the dental profession of the future. Let them look to it that they are worthy of the trust !

The thoroughly qualified man in any profession is the one who is thoroughly grounded in the fundamentals. We have confidence in the physician or lawyer or theologian who, by a long course of study or training, has become well educated and learned in the fundamental principles of his profession, so that he can approach practice from this strong vantage ground. The weak man is the one who is superficially educated, who knows little of the great principles underlying his calling and is a self-confessed empiric. Empiricians will not answer the demand of an intelligent age. Practice must not rest upon experiment but upon science, a professional education is presumably a scientific education. The trades are learned by practical methods alone, but the professions are acquired by the study of the sciences involved. We claim to be a profession, therefore let our education be scientific that we may justify the claim. Let us guard the scientific branches as the vital part of our education, to lose which would be to lose all.

## EDUCATION AND THE OBLIGATIONS IT INVOLVES.

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BY CHAS. B. ATKINSON, D. D. S., NEW YORK, N. Y.

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Education presents a very broad field for consideration. It may deal with ideal results, and be confined within practical limits. It is from the ideal, nevertheless, though it may be impractical, that the true growth comes. Criticism upon advanced writings, or writings on advanced lines of thought, is often expressed in some such words as "up in the clouds," or "metaphysical."

The severely practical mind, or perhaps rather *the severely bigoted* mind, does not grasp the value of speculation upon the *possibilities* of new lines of effort. Without these, invention would fall dead, and dentists employ the results of inventive genius to a very large extent. The dental cry is for skill, higher and higher—in manipulation and in implements, appliances and materials. Experiments may be practical, carefully thought out efforts, and they may be merely time occupied with no definite purpose in view, and based upon no definite information. Both of these efforts reach useful ends, but it is apparent which may be expected to realize the best results.

Education should embrace *all the higher* attainments. Speculation and indefiniteness in the education of undergraduates is pernicious. The true training of the student will occupy all the time placed at his disposal to fulfill the prescribed college course. The various theories and methods, many of them severely antagonistic, which are embraced in college curricula, give rise to the development of practitioners with divergent ideas from the start upon questions which may readily be brought up and receive common explanation, and proved to be governed by definite conditions, and so made to agree. The lack of harmony in the profession and among the college faculties, as regards their several methods of

teaching, is responsible for this. Each chair seems to think it necessary and desirable to promulgate a theory for which they should receive special credit. This is one of the toles to invite new students, the intimation being given that information in certain specified subjects, will not in other schools at all compare with the one in question. Each and every school has some one or more specially meritorious methods, to a great extent enjoyed individually, but a broad professional spirit would indicate a proper course to be inter-communication among the faculties frequently, or enough to secure a practically common basis of education. Let all the schools teach dentistry the same way, let them harmonize their minds and theories, so that they will all stand agreed upon facts and methods. At least, if not endorsing the same methods, let *all* methods that are accepted by any sufficient number be promulgated in every school in the land. Give the student a chance to know all there is before the profession. That is the purpose of the school—to teach the assembled knowledge up to date, and always keep up to date. It would be considerable trouble to re-write the lectures from year to year but where is the wisdom of reiterating the same old lecture year after year and session after session, without incorporating in it the changes that practice has brought to the profession.

Why is it that at our society meetings papers are written by the few, and discussed by the few even when dealing with practical everyday points? If the proper spirit of harmony were present in our societies, the youngest among us would feel free to have his say on every question discussed. Individual preferment stands steadily in our way. How often do we hear a man who says he knows better, and who does know better, when taken to task for extracting teeth at wholesale, make the remark, "Yes, I know it is wrong, but what am I to do? So-and-so does it, the people will have it, and my family must live." Who is to blame for the people demanding extraction? The dentist, every time. Perhaps not the immediate one before whom the issue is brought, but the class of men in general who have not the common honesty, education, moral courage, humanity, sense of decency and belief in the hereafter, to stand up against indiscriminate extraction of teeth.

One may say this day is passing away, but oh, how slowly. Not long since, in this present year, at a dinner given by dentists to a dentist, the great administrator of nitrous oxide gas, George



Quackenbos Colton, rose to his feet and told a tale of how he had extracted *three thousand* teeth in a limited time in the city of New Haven, in the office of a dentist. The dentist was there and did not deny it, and but one voice was heard in condemnation of that outrage on common decency—the voice of Dr. Bartholemew, of Springfield, Mass. That a man could find it possible, indeed, would dare to assemble with dentists and deliberately make such a statement, boast of it, in fact, shows that there still is need to ring the changes upon “no extraction.”

How many college students know how to recognize a case of pyorrhœa alveolaris? How many practicing dentists of considerable experience actually claim the disease to be incurable and recommend extraction, or the patient waiting of the sufferer till the teeth drop out as the only thing that nature has in store for them?

These dentists must either disbelieve the published literature upon this subject, or ignore its reading.

When a man bases his fees upon a charge of \$1 to \$2 per hour of working time—just consider facts and see how many do that—what can you expect of such a man? His time must be occupied with cheap work from the patient's stand-point to make it possible for him to make a living. Such men are mechanics and should go into machine shops or carpenter shops or other mechanical shops, where they belong. Their comprehension is certainly beneath the standard that *dentists* should maintain. *Is* there any fair proportion of dentists who charge for treatment of teeth? *Is* there any fair proportion who charge a consultation fee for the time spent in talking over a case and doubtless giving the patients information which they use elsewhere to argue with some other practitioner on his fees for the work.

What proportion of dentists inquire of a patient who their last dentist was? or ask if the work is completed that the former dentist had undertaken, or make any effort to determine whether the patient owes a bill to some other dentist before they undertake the care of their case. This as a general rule, is unnecessary and impolitic, but many, many cases present for treatment with the plain statement that they have left a dentist to seek other treatment, and they are gathered right in, and if the second man (the gatherer) lost by them as badly as he makes it possible for the first man to lose his fees, it would but be a fair return. We talk about being a profession;—the great mass of us don't know what the

word "profession" means. The code of ethics is outraged every day, and so is common sense and common honesty, as between man and man. There is such a thing as being a merchant, a trader, a mechanic, and such a thing as being a professional gentleman, but they are widely different. This very association has witnessed a degree of political rivalry from which every aspect that could be called professional was removed, and the influence of this, which is called the "national" body, has been very seriously minified thereby. The first step that the education of a professional man seems to involve is a determination as to the propriety of the individual undertaking the study of the professional branch under consideration. The colleges have many times made the claim that they did the best they could with the poor material sent to them. This is a good argument, and it seems that were private pupilage made a requirement for admission to college, the tendency would be to gradually eliminate undesirable aspirants to practice. In this connection it seems proper to suggest a way that would permit an individual to enter the college course without being a pupil of a practitioner, and in such a way as would select the material as effectually, or more so perhaps, than the private pupilage could. One plan would be to have applicants recommended, after an examination as to antecedents and personal character by a local association, preferably a section of the State society; submit these applicants to a preliminary examination, not only as to intellectual attainment, but such an examination as would embrace the determination of manual dexterity and mental ingenuity from the mechanical aspect. There is no need for more men whose sole aim in life is to extract teeth, or put in rubber plates, and if the required moral qualities are not possessed by the student, the indications of which this preliminary examination would disclose, his further education in the profession will not benefit it. The status of morality is settled individually as a matter of inheritance, but also it may be influenced by early education and the surroundings of childhood, and by the time the student has reached the age that may make him eligible to undertake the college course, his moral nature is set in the direction that it must follow for the future. Hence this preliminary investigation can establish the quality of the student seeking dental education; that is, select the material the colleges ask for.

The societies that have been established in some of our colleges are a grand effort in preparing the student, along with his acquire-

ment of knowledge, for the effective use of his knowledge after graduation. However, the work of these societies should have some consideration from the faculties. It seems proper that the work done in them should influence to its proper extent the final examination and status of the student in his class. This would give a stimulus to perfect the work done that they now seem to lack. It would also stimulate the backward ones to come forward in the student's society, and the sooner a man learns this lesson the better it is for him and the patients under his charge. The mere fact of presenting a subject before an audience gives the presenter of it a wider and broader grasp of the subject in hand. It is an education directly beneficial to him; although many times undertaken with very different motives. Too many men look upon literature as a means of advertising. What inducement is there aside from the benefit that a professional man always feels in helping forward the standing of his profession by presenting questions to discussion; what other inducement can an individual have to cause him to take the time necessary to write his paper; take the time again to attend a meeting, pay his expenses and present it before an association? Some men seek preferment and think to get it, and do get it through these means; but it does seem when an association calmly invites a man to devote anywhere from \$200 to \$500 worth of his time, pay railroad fares of anywhere from \$10 to \$50, and hotel bills of a corresponding amount, they should be recompensed to the individual somehow. Undoubtedly each individual professional man owes to the body a tithe of work for the benefit of the whole, but what proportion of dentists are working for the benefit of the whole? The few bear the brunt of literature, the few the brunt of clinics, some of the rest hold office, and the remainder take all that's offered them. It seems that we owe something to our pioneers; the time is ripe for us to show in some tangible shape that we value and appreciate their efforts. An attempt was made in the State of New York to compass this desire when a Legion of Honor was proposed, to which only honored names should be eligible. A fear of politics letting in unhonored names, and perhaps dishonored names, caused the matter to be dropped. It was perhaps wise that it met such fate. But America—the United States of America—has born and bred several names that should live forever in dentistry. These names belong to individuals who have trod the rugged path and climbed the heights



of skill and knowledge, cleared away the stones and sticks, smoothed out the ruts and made it possible for us to expect to be a profession. Some of these honored names are now but names; of them we have but memory of the noble deeds accomplished. But we have with us living holders of honored names, whom we cannot afford to ignore any longer. It must be small satisfaction to an individual to only be able to say "when I am gone, I will be thought of." How much better, how much nobler of us, now while they are with us, to take off our hats and let them see and feel the honor we would do them. They have for years spent their money, spent their time, spent their brains, and spent their bodies for our behoof. We are better to-day for the efforts expended by them. It is our duty to make them feel it. It is a matter in which wise counsel should prevail, animosities, personalities, should be resolutely eliminated from any consideration given to this question; warning should be taken from past experiences, and such procedure adopted as would exclude misuse of this laudable effort. The matter is advanced here at this time because such an effort should emanate from the representative association, and in view of the proposed Dental Congress, it would seem well that such steps be initiated now as would produce creditable results at least by that time.

The occupancy of office in an association is supposed to carry honor with it. The contrary of this is too often true. This shows that election to office in a body such as this is not an adequate honor to bestow in recognition of the services the pioneers of dentistry have rendered in our growth. Some of these worthy names are unknown to literature. The voluminous writer does not of necessity belong in the list. True worth, and it only, should be the measure for decision. A professional education forces upon an individual certain duties. He is prepared to combat disease, and it is his duty to do it. Not as too many do—combat disease as a means of livelihood, because he is paid for the time spent in the effort—but combat disease because he is fitted to do it. The recompense will come to the earnest man every time. For some years to come, until the personnel of the profession has been purified of the improper elements now within its composition, the business element must needs have a voice, and a somewhat loud voice, but it need never be paramount to honesty. However, a man may be honest according to the training he has received. Here

the college is at fault. If unproved theories have been presented to him for facts without demonstration, and the opportunity for demonstration on his own account denied him, false doctrine may be the basis of his practice. With a properly arranged intellectuality, the three course studentship of six months each should be sufficient to acquire a practical knowledge of dentistry provided the other six months in each of the three years is devoted to infirmary practice. The preliminary examination now generally adopted is expected to deny admission to uneducated students. Education may ask of us to present to it proper material carefully selected and the exertion of such influence upon the college faculties as will equalize the instruction given in the colleges, and equalize the character of graduates ushered into practice. This would make it possible to meet the statements of those who urge repeated examination and pave the way for uniform laws and regulations for admission to practice. Graduates, the older graduates, owe it to the younger to set an example of probity and honor, as between themselves, and between themselves and their patients.

Ethics being based on simple honesty, common sense and good fellowship seems to be a question that would take care of itself, but it crops up for discussion—and does not that indicate that simple honesty, common sense and good fellowship are to an extent lacking in the profession at large.

## NATIONAL DENTAL EDUCATION.

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BY R. OTTOLENGUI, M. D. S., NEW YORK, N. Y.

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MR. PRESIDENT AND GENTLEMEN OF THE AMERICAN ASSOCIATION:

I have the honor to address you on the subject of advanced dental education. I have had some experience in journalism, and I have discovered that even a good and valuable idea may lie buried, and therefore lost for years, notwithstanding the fact that it may have appeared in a leading journal. Midst the busy rush in this waning century, we read, commend, and then—forget. To appeal to men's minds and obtain recognition for an idea, the originator must cry from the house-tops and keep crying till he attracts attention.

I have conceived an idea by which I hope to see the school system in our profession improved till the man who holds a degree which permits him to experiment on humanity, shall be a man whom humanity may trust. In my mind's eye I see the time when those who are endeavoring to retard our onward progress by advocating the idea that we have no individuality, but are only a part of something else, will be silent, because the honor which they seek for us will be unnecessary, from the fact that to be a dentist will be honor *par excellence*.

This cannot be whilst diplomas may be granted by any ten men who have influence enough, or money enough, to obtain a charter from a corrupt or corruptible legislature. This cannot be whilst the men who grant degrees, are winning dollars in proportion to the number of men passed. This cannot be whilst the colleges set their own standards, even though they honestly live up to them. Such standards are necessarily influenced by environment; therefore the graduate of one college is the superior of those from another school, apart from individual excellence. The time must



come when a dentist will be a dentist. In that day the dentist in California will be the same as the practitioner on the Atlantic coast or on the Mississippi. In that day the dentist will not be a specialist in medicine, because he will know all that his medical brother has learned and something more. He will be an oral surgeon in all that the words can be made to imply.

But this you say is Utopia ! How is all this to be accomplished ? I cannot tell you, but I can suggest a method which will lead us in the right direction.

A year ago it seemed to me that I had found the solution to the educational problem. I studied and elaborated my scheme till, at last, in the January number of the *Review*, appeared my monograph entitled "Looking Forward." This contained a description of that which you say is Utopia. As I have said, the single publication of an idea attracts little attention. It was not a part of my plan, however, to let the matter rest with this one article. In that I described the ultimatum. It remains to show the means by which we may attain it.

I had reprints made which I sent to leading men, at home and abroad, asking for a reply expressing an opinion as to the desirability of the change which I advocated. I will give you quotations from a few of the letters which have reached me, which will emphasize the fact that the present system is considered inadequate. But first I must quote from "Looking Forward."

The following conversation is supposed to have occurred in the year 2000 :

"Yes," said I, "I can remember that there were a large number of colleges and considerable competition between them. The number of graduates was enormous."

"Exactly. There was great competition. There were too many schools, and the result was that men were graduated who were not sufficiently qualified. The colleges were forced to do this that they might attract students. Finally, the several States began to protect themselves with prohibitory laws. State Boards of Examiners were created with power to confer degrees and to control the practice of dentistry in their localities. Massachusetts, even made it compulsory for a man to obtain her special degree. It was obnoxious for a man graduated by a college to be compelled to submit to a second examination before he was allowed to practice. Yet the law was meant to force a higher standard on the colleges.

Thus degrees were multiplied and each State had a separate dental law. In the United States Congress, which met in 1924, a new era dawned. At last it was seen that the sovereignty of the States on certain questions was a menace to the integrity of the Union as a nation. Amendments to the constitution were recommended, and finally adopted, which enacted national laws on many questions, repealing the existing State laws. The most important of these laws were in relation to marriage and divorce. There were a number of others, and among these were laws regulating the practice of medicine and dentistry."

"You mean that there is now a national law regulating the practice of dentistry?"

"Exactly. It is brief and effective. No man may practice in the United States unless he holds a degree conferred by the National University. That is D. O. S.—Doctor of Oral Surgery. It was deemed advisable to make the degree a new one, that the law could be better enforced."

"But," said I, "since there can be but one university, it seems unjust to compel attendance from distant localities."

"You do not grasp the idea. The colleges continue to exist as heretofore. They are the schools. A student attends a course covering three full years. If he passes the examination at his college, a certificate is accorded to him which entitles him to attend the University examination."

"He is not admitted at once, then?"

"Of course not. In that case the standard of excellence in the colleges could not be controlled. No, he must be examined before entering the University. If he passes, he attends a course of lectures covering six weeks, and is then examined for his degree."

"There is still the objection which I raised. The student from a distance is not on an equality with those living near by."

"The certificate granted by the college entitles the student to free passage by rail and return, to and from the University town. Of course this is simple since the Government bought out and controls all railroads."

"Suppose that a man does not pass either of these examinations?"

"In either case he is returned to the college. And, as the college was evidently at fault in granting its certificate to an incompetent man, it is compulsory on them to receive him for a fourth

term without fee. This is a further incentive to make the colleges strict."

Doctor Louis Ottofy follows my example and dates his reply 1990, or one hundred years ahead. He says :

"The subject of education is under the immediate control of the Minister of Education—the Secretary of Education, who is a member of the President's cabinet, ranking third in the order of precedence, the Secretaries of State and of the Treasury outranking him. The entire educational system is under his control. A constitutional amendment, ratified by all the States, having voluntarily yielded this part of the sovereignty of the States to the general Government for the general good. There is a National University at Washington and a State University in each State. Departments of each State University are established in different cities according to the location where the best results may be derived. In this way it happens that the Agricultural Department of the University of Illinois is located at Podunk, while the dental and medical schools are at Chicago. The Secretary of Education will permit the establishment of only the number of schools necessary for each profession. In 1990 there are five dental schools—in San Francisco, Chicago, Boston, Washington and New Orleans.

The Board of Examiners, consisting of five, conduct the examinations, one at each school, at the same time. Nothing less than the B. A., or its equivalent education, will admit a student to the State University, and he must have devoted at least one year to manual training."

The doctor does not exactly explain the working of the National University, but I suppose he means the classes there to be made of graduates from the State Universities, in which case it would be a sort of post-graduate course for the men who are really anxious to become fully educated. Such a system as Dr. Ottofy describes is devoutly to be wished for, but a national public school system is in the dim future.

Dr. G. V. Black writes :

"Perhaps the matter of dental education will never be entirely satisfactory to those of us who make an earnest effort to push it forward. *Certainly it will not while the qualifications of the pupils, both for entrance and exit, are controlled by that circular God with the eagle stamped on the reverse side. I have become satisfied that it would be best for all concerned, if the final examinations were controlled by a board free from that kind of influence.*"

Dr. J. Allen Osmun writes :

"In reading your article 'Looking Forward' I am more than ever impressed with the fact that some scheme of universal application is urgently needed, in order to equalize the various laws now existing in relation to the practice of dentistry." \* \* \* \* "It would a grand thing for the dental profession if something definite could be brought about so that *all graduates should stand on an equal footing.*"



Dr. C. N. Peirce writes :

"I fully sympathize with your idea that *we shall never have a satisfactory standard of efficiency until we have a national—a single body—upon whom shall devolve the responsibility and power of conferring the degree which shall represent that standard.*" "Your Dental University nicely covers the idea. The school, or rather the faculties that teach, must be deprived of the power of granting degrees. To reach the ideal it must be done by an impartial body who knows the applicant only through his qualifications, and without reference to where he has been educated."

The following letter is of great interest, because it gives us an idea of how our college system is considered abroad. It is from Dr. A. C. Hugenschmidt, of Paris, well known here through his writings in the journals.

"I am very glad to see that an American citizen, and a member of our profession, should have indicated that it is time to call a halt to the manufacture of D. D. S. by the cart load, as is done by certain colleges in the United States, without sufficient consideration of the baggage of scientific knowledge possessed by those who are armed with this degree. The American diplomas of D. D. S. had attached to them a well deserved reputation throughout Europe, until within the past few years, when it was observed that those who went to the United States, for the purpose of acquiring an American degree, could return to their respective countries after attending a course of a few months at one of your second class colleges, bringing back with them an amount of knowledge much inferior to what had always been expected from one who possessed an American dental degree.

"From that time the reputation of American dental diplomas began to be dimmed, and a year ago Germany passed a regulation by which the possessors of American diplomas are considered inferior to those who had obtained certificates from the German Universities.

"One trouble is that many of your colleges seem anxious to boast of a large number of diplomas granted. They make no mention of the number of rejected candidates. I, certainly, for my modest part, *would think a thousand times more of a college which could say that out of sixty candidates who presented themselves for examination, twenty had been rejected for insufficient preparation, than I should of an institution which should advertise to the world a long list of graduates, with none, or scarcely any, who had failed to pass.* One does its work properly and the other improperly. One gives to the world practitioners who are able to maintain the reputation of the profession, and the honor of their Alma Mater. The other allows men to go out amongst the people insufficiently trained to do their work, many of whom sooner or later become not only a disgrace to our profession, but a menace to the community.

"Whilst in America I heard that in a certain school, foreigners were allowed to obtain a diploma without knowing sufficient of the language to understand the lectures; and what seems worse, that in the examination rooms the questions and answers were translated by the "quiz-master" who had prepared the student for these examinations.

"Certainly, as you wisely propose, the only way to suppress these abuses, would be by the founding of a national dental university, which should be the only institution having the power to deliver the official diploma, which would allow a man to practice in all parts of the United States."

Dr. Hugenschmidt continues his letter, giving a description of a method by which the dental schools might agree to accept examination papers supplied by a national convention, the replies to be written in the presence of an officer of the convention, and returned to a national examining board, who shall decide who are entitled to diplomas. He says that this is successfully done in some of the art universities in France. I do not give this in all the detail which the doctor has kindly supplied, because the colleges, as he suggests, would need to voluntarily cede to the national board this right to examine their students, which they would either decline to do at the outset, or any college might determine to withdraw from the agreement subsequently.

The question then recurs: If the voice of the profession is universally favorable to a higher standard, how are we to reach it?

The salient objections to the present system are these:

(a) Each school erects a standard of its own, intentionally or unintentionally, influenced by self-interest. The school depending for income and profit upon the number of matriculants, is apt to admit men easily. The attraction, to a large number of men being the chances of easy graduation, it is to the advantage of the school to graduate as many as possible.

(b) The professors in many schools, instead of receiving fixed remuneration for their services, are directly interested in the conduct (commercially) of the institution, owning stock and drawing a share of the profits. Thus they are benefited by the results of objection "a".

(c) In many schools the junior and senior classes receive instruction together, listening to the same lectures. This saves the professors from preparing and delivering two sets of lectures, one primary and the other advanced. The result is that much of the first year is wasted, because technical terms are used which can only be intelligible to the advanced student.

(d) In many of the colleges the students are under the guidance of only one or two preceptors in each department. The result is that with large classes, only the insistant student can demand, and obtain, proper instruction from the preceptor. A

student with this quality of insistence is probably a man who will eventually learn without instruction, but by demanding what is his just right, due attention from the teacher, the duller student receives even less attention.

If we could deprive the schools of the right to grant diplomas most of these objections would cease to exist. The school becoming merely educational in its purport, with a standard, erected by an independent body, which must be reached by its students before diplomas are granted, that very *self-interest, at present operating insidiously against high education, would be the most potent factor toward increasing the facilities for acquiring knowledge.* The first year after enactment of such a law, there would at once appear the difference in the educational advantages of the institutions. Each of ten colleges sending up a hundred men, let us say, a different number would be passed in each case. Suppose that the graduates credited to each of these colleges should happen to be 83, 81, 80, 73, 71, 70, 65, 60, 50, and 40. It would be obvious at once that the three colleges passing over 80 per cent of its students possessed the best method of instructing students. That the three passing over 70 per cent were good colleges, the low percentage possibly depending on the mental grasp of the students. That the colleges passing respectively 60 and 50 per cent of its men were second class institutions, and that the college passing but 40 per cent was but a poor apology for a school. We would have a basis of comparison of the work of the schools and the students would, through *self-interest* be attracted to that institution which offered the best chance of learning enough to pass the final examination. Thus the colleges, driven by lack of patronage would be compelled, again through *self-interest*, to increase their regimen and improve their facilities. The 70 per cent schools would be more strict with its initiatory examinations. The fifty per cent schools would engage better teachers, and the forty per cent school would go out of existence, if it could not make a better showing within a reasonable period.

All this you must admit. Still though you agree that a National University is a thing to be desired, you point out the fact that it will require National and State legislation, and at best cannot be hoped for within this century.

Must we therefore remain quiescent awaiting the desirable but not expecting attainment? If we do so, and our children do like-



wise, how will accomplishment ever be reached by our profession? An energy must be inaugurated which shall eventually bring about the thing desired even though it require half a century in its operation.

I believe that it is within the power of this body to start a scheme which will overturn the present system of colleges, and better it within twenty years. This is my plan:

Granted that we cannot at a bound inaugurate a National University, and compel the colleges to submit their students for examination. We can, however, without asking any power (or if need be, we should be able to obtain special permission from the United States government) we can, I say, create a *National Degree*.

Having obtained a special degree from Congress, if need be, this body shall then proceed to select from its members, or from the profession at large, twenty men, who shall constitute the *National Board of Examiners*. These men shall be residents of all parts of the United States for reasons which will be assigned. They shall have the power to confer a degree to be known as D. O. S., *Doctor of Oral Surgery*. This degree must not be D. D. S. because the public is to be instructed as hereafter described, that the national degree is higher than a college diploma.

This national board shall meet alternately on the Atlantic coast, along the Mississippi, and on the Pacific, once annually. On these occasions they shall examine candidates and confer the national degree. Any one shall be eligible to examination whether he be a college graduate or not. This will at once show that the college is counted merely as educational. If a man can acquire knowledge without the college, there should be no reason for forcing him into a school. The theoretical examinations shall be in writing, and the practical examinations shall be through clinics. Each examiner shall have the privilege of rating his candidate by per cent, this allowing more accuracy than the voting system. For example, in the written examinations there should be *one hundred questions* on each subject, each answer being worth one per cent. In the practical there might be twenty tests each worth five. It should require a mean average of 80 per cent. to pass.

There should be a fee attached to the granting of the diploma which should go into the treasury of the board of examiners. This fee should be variable according to which section the candidate resides in. For example, should the fee be \$30 it should be

charged to those on the Atlantic slope when the board meets in that section. At these times the Mississippi valley men would pay \$20, and those from the Pacific section \$10. The reverse would hold when the board meets on the Pacific; but when the meeting is on the Mississippi those from either coast would pay \$20 and the Mississippi men the full fee.

This would be a slight concession to those traveling long distances, but there is another provision which is intended to meet the cases where the expense of travel would be prohibitory. Still it must be remembered that a man would wait only three years before the board would meet in his section, and only one or two before it would meet in the section least distant from him. However, supposing that a man desires to be examined and does not wish to travel. In such a case the candidate must notify the examiner living nearest to him. This notification is read before the next full board. Immediately after the convention, each examiner must present a written copy of the questions to be used by him in his examinations, which must be approved by the vote of the whole board. This done they are printed on slips. A set of these printed slips may be entrusted to the examiner presenting the name of the candidate who wishes a special examination. Upon the return of said examiner to his home, he is to summon the candidate to his office, where under his eyes the replies to the questions on the slips are to be written. After which, each slip must be mailed to the individual examiner of each specialty, who in the usual way will rate the candidate and forward the slip with his rating to the proper officer of the board, who shall figure up the percentage and announce whether the candidate has passed. If he is passed he must wait for his diploma until the board's next meeting that the examiners may conveniently sign the diploma; but a certificate may be issued in the interim.

The candidate must also submit to the regular practical examination, as much of his work as possible being sent to the proper examiner of that department. The fee for this special examination shall be double the regular fee.

If this association would inaugurate such a system as this what would be the result? It would become necessary to adopt some method of constantly keeping before the public, through the secular press, the fact that there is a high standard of dental efficiency which is represented by the degree D. O. S. Once this were wide-

ly understood, the better class of patients would seek the D. O. S., and consequently the D. O. S. diploma would be sought by students. Many men who delight in many degrees would obtain the D. D. S. and then apply to the national board for the special degree. Thus in a brief number of years we would find graduates from the various colleges applying to the National Board, and by publishing in our journals the results and percentages of graduates from each college, *we would shortly reach that point where the self-interest of the college would compel it to prepare its men with special design that they should be able to pass the National Board.* They would begin to boast, *not of how many men graduated from their private schools, but rather as to the number of their graduates who had succeeded in obtaining the National Board's degree.* Immediately thereafter some school, bolder, or richer, or better equipped, than the others, would apply to the National Board requesting that the Board should undertake the examining of its men altogether. That would be the dawn of a new era. The millenium would be at hand. Dentistry would be a profession and no longer a specialty. The step towards a university would be easily taken.

It may be questioned whether this National Board special degree would have the effect predicted. I can offer proof by pointing out the work done by the State Board of Censors, New York.

When it was announced that they had obtained legislative permission and authority to examine men and grant degrees, certain men interested in colleges at once set up the cry that this was to be a white-washing board: that the whole thing would be a farce.

The degree has been in operation since 1870. Beginning with that year up to date, there have been 210 men examined, of which number the degree has been conferred upon 103, less than fifty per cent. These figures show that the work has been conscientiously done and that the board has not whitewashed any one. After a few years it began to be observed that the M. D. S. was difficult to obtain, rather than otherwise, and it was coveted by some graduates. Of graduates, 25 have applied, 22 being successful. The three who failed, though a small number, is a large percentage, 12 per cent. *If twelve per cent of all the college graduates are incompetent, we readily see how it is that there are so many charlatans, advertising men, whom we cannot legally drive out of the community, because they hold diplomas.*



But when we consider that these three men *voluntarily* went through this ordeal, we see at once that were all graduates *forced to submit to a supplementary examination, the percentage of failures would be nearer twenty than twelve.*

All of which emphasizes the fact that we need some method of raising the standard now held by the colleges. If we cannot do so by legal enactment, perhaps we can by moral force. We have seen that Massachusetts and New Jersey have passed laws creating a board of examiners which has the right to examine even a college graduate before granting a license to practice. If such a law were made in all States and the National Board were so conducted that the State Boards could say, "*We will grant licenses to the holders of the national degree without examination,*" see what a power for good the National Board of Examiners would be.

Gentlemen, I have done. God speed the day when we can be proud of our profession, because of the fact that only the highly gifted can enter it.

The following are the departments suggested for examination :

#### GENERAL.

- |                |                    |
|----------------|--------------------|
| 1. Anatomy.    | 6. Materia Medica. |
| 2. Physiology. | 7. Therapeutics.   |
| 3. Pathology.  | 8. Bacteriology.   |
| 4. Histology.  | 9. Metallurgy.     |
| 5. Chemistry.  | 10. Microscopy.    |

#### SPECIALLY DENTAL.

11. Methods and materials for filling teeth.
12. Diseases and treatment of the teeth.
13. Diseases and treatment of gums and processes.
14. Oral surgery.
15. Embriology, origin and formation of the teeth.
16. Treatment of cleft palates, and restoration of lost parts.
17. Diseases in the oral cavity requiring constitutional treatment, resulting from or causing constitutional disturbance.
18. Prosthetic dentistry.
19. Orthodontia.
20. Crown and bridge work.

## DISCUSSION.

DR. NOBLE : We have been trying to get a law passed by Congress, for the District of Columbia, and we found in looking over the laws of the different States how greatly they vary, and so came to realize the importance of their unification. We have been working to secure legislation in the District of Columbia for years and have not yet succeeded. We have a bill now before Congress, and if any of you have any influence with your congressmen we want you to help us at this time, otherwise we are not likely to succeed.

Dr. Peirce's reference to having a National Board, seems to me an excellent suggestion. We have got to come to the point of having not only our State laws in uniformity, but our colleges all in proper shape, and the best means to accomplish this would be, I think, through a National Board. If we can bring this about, our State laws must be so framed that a degree coming from the National Board would be sufficient in all the States without a re-examination.

The paper read before one of the New York societies, by Dr. Shepard, on this subject was very good, and I hope there will be some definite action taken at this meeting.

Dr. Peirce's report referred to the fact that very few of the States were represented at our meetings. I have followed this association with a great deal of interest and faithfulness since its meeting at White Sulphur Springs, and have been very sorry to see no greater national representation, and to feel that we did not succeed in making it of sufficient interest to call delegates here from every one of our States, thus making it a truly representative body. There is something that is not right, and I know there are many things that can be improved in the way of getting down to work. If, as Dr. Peirce suggests, we should require each delegate that presents himself here before the society to make a report of the work done by and the condition of the society that he represents, or the societies in his neighborhood, it might be very advantageous. I don't know that I have anything definite in that direction to suggest, but something should be done so that when we come together we may be able to learn what has been done in all parts of the country during the year.

I have heard many papers here which might profitably have been read to students, but we old fellows don't want any more of that

sort of pabulum. If there is anything new that will interest, instruct and spur us on and bring us to a higher plane, that we want ; but we do not care to waste our time on teachings, such as have just been referred to.

DR. E. PARMLY BROWN : The question of the unification of the dental laws of this great nation, composed of forty-nine states and territories, is a very important one. I have been in the habit of telling in this country and abroad that the American Dental Association stands pre-eminently ahead of anything on the face of the earth in the way of a dental organization. It is an assertion that no one has ever dared to contradict, and if this subject is to be acted on by this body, and a committee is to be appointed, it should not be given a month or a year, but five years in which to accomplish their work. Is this a union? Not by a long shot. If we have forty-nine dental laws, each differing from all the others, we can imagine what the condition of affairs must be. I have been in dentistry all my life, but if I were to go to the State of New Jersey tomorrow to practice I should have to stand an examination before a lot of my boys, as I call them, men that I have made dentists of ; to go before my children and grandchildren and great-grandchildren and have them ask me questions. They could ask them and I should fail, according to their law, but I can take over into the State of New Jersey a little boy seven years old, who will ask all the boards of examiners in this country ten questions and they will not answer more than one of them. I want but ten minutes to coach him.

If this association would compile from all the State laws a law that they considered good and recommend the same, it would have some weight.

The State of New Jersey says that a man having a half dozen diplomas, who has been practicing for over a quarter of a century, and who comes within their borders, must go before their board and answer a lot of questions which he has forgotten before many of them were born. That is simply nonsense. What is it done for? To keep good men away, to keep men from coming into their State so that they would have the whole of that territory that separates New York from Philadelphia.

DR. STOCKTON : For a long time ministers, lawyers and philanthropists have been endeavoring to make a uniform law for the States in regard to marriage, but so far have failed. So it would be



in regard to the unification of the laws relating to dentistry. It will probably take the committee that shall be appointed to make a uniform law for all the States, more than five years to accomplish the task, and when the committee have framed the law to their satisfaction, it will take an almost indefinite time for them to get it through all the legislatures of the States. Those of you who have done any work with the legislatures know how difficult it is. Dental legislation has been quite phenomenal in New Jersey. Some few years ago there was no law. Then a law was enacted that there must be an examination of all not graduates before a board of examiners. That helped dentistry in New Jersey very greatly. The State society also helped it very much. Then an attempt was made to pass a law that would confer a State degree under which the recipient could practice. Fortunately for dentistry, fortunately for New Jersey more particularly, that bill did not become a law. The very gentlemen who wanted it to go through are glad now that it did not. And now, as Dr. Brown has said, there is a law in the State of New Jersey that no one can practice dentistry unless he goes before the board of examiners, no matter how many degrees he may have or where they come from. Now you may think from what my friend Dr. Brown has said, that if in the providence of good luck, my friend here, the father of dentistry (Dr. Atkinson), should come to New Jersey, that he would not be allowed to practice dentistry without an examination. Do you suppose for one moment that that was the intention of the law of New Jersey? No. Father Atkinson can come to New Jersey and practice as long as he lives, and so can any man who is *qualified* to do so, but that law was passed in order that men, coming from colleges either with or without diplomas—unqualified—may be stopped at our threshold.

I have in my mind now a gentleman who graduated from one of the most prominent dental and medical colleges of this country and who stood too in every department. He was clear up, and knew as much apparently as a young man could learn, yet when a hard rubber plate with a bicuspid tooth broken off was to be repaired, and he was told by his principal to put on a cuspid tooth and build up the inside cusp with rubber, he did not know how to do this, one of the simplest things in dentistry.

I would say in closing, in regard to the working of the law in New Jersey, that the law has done much for dentistry. It has come up from the low state in which it was years ago to the height

which it occupies to-day. Its State society and its dental laws, I think, have been the factors which have worked the change. Those who have attended our conventions will acknowledge that dentistry has attained as high a standard in New Jersey as in any other State in the union.

One word in regard to the working of the sections. It has been suggested by the president that a committee be appointed to formulate some plan that shall lead to improvement in this direction. We have found for the last two years in our State society a plan that has worked admirably. When any gentleman consents to read a paper before our State society, we exact that if possible three months previous to the time of its being read it shall be in the hands of the committee or the secretary. That committee selects one, two or three to read the paper, and to write another paper upon the paper submitted. If that system could be inaugurated here in our section work, and papers that come before the section were presented to those throughout the country who are familiar with the particular subjects treated of for revision and criticism, we should have something worthy of the work of the sections.

DR. A. WILKES SMITH (of Kentucky). In regard to the unification of the dental laws, I would say that I do not think dental legislation will make dentists more proficient in their calling. I am in favor of very little legislation, just enough to draw the line of demarkation between the professional gentleman and the pretender. If it were possible to get together a large representative association I think that this might be accomplished.

With regard to securing a larger attendance upon this body, we know that many of the men that come here, come at a great sacrifice, and if this body were to send a recommendation to the various State associations suggesting that they appropriate a fund for the defraying of the expenses of delegates, I believe we should in a very short time have our association well represented.

DR. CRAWFORD: I am very much interested in this subject. I think my friend, Dr. Smith, is to a great extent right. It is questionable in my mind whether much of the discussion that we have had upon the subject of dental education has been conducive of good. If we go on in the line we have been following, in my judgment we shall reach such an extreme ultimately that a reaction will take place. Perhaps it would be well for us to ask ourselves a question or two; and I ask this intelligent body, has the aggre-

gate of the results, not only to the dental profession but to the whole people—of all this turmoil and discussion and work that we have done—added very much to our progress? I am sorry to say that I live in a State that has no law regulating the practice of dentistry, and in traveling over this grand country of ours I am forced to say that, in my judgment, there is scarcely a difference in the appearance of things in States that have laws and States that have no laws at all. The main point of this question has been lost sight of, that the principle good that is to come to the whole people involved, is through the moral force of the laws, and, therefore, the simpler the laws the nearer we shall be right. I labored for eight years upon a committee asking our State to give us the simplest law regulating practice. At the end of that time I told our legislature we would turn the matter entirely over to them, and I am satisfied for the next few years, at least, the dental profession in the State of Tennessee will have nothing to do with the question of legislation. If we have laws on this subject in the various States they should be in harmony with what is right, just and courteous in their application, and they should conform to the advanced thought of the day. We should follow the example set us by the legal profession.

If a young man, from whatever station in life he may occupy, makes himself competent to enter the legal profession, he receives a license; if he goes into another State than the one in which his license was granted and presents his credentials from the proper authority, the judge upon the bench says, "Mr. Sheriff, furnish the gentleman a seat." I want to ask the honored members of this society who have been more than thirty years in practice, how many of them could stand a 75 per cent examination before any State Board? And yet you would deprive competent men of the privilege of practice. When the great State of New York grants a man a license to practice dentistry, that license should stand for all time unless the man receiving it is guilty of a violation of the code of ethics. Show me a man who will openly violate the code of ethics and you may make all the laws in the world, and that man will ultimately disgrace himself and bring reproach upon the profession to which he belongs. Extracting teeth for twenty-five cents! O, my God! In Tennessee I believe there is a smaller number of men who will perform the operation of extracting teeth for a quarter of a dollar, than in any other State in the Union, and



we have no law. Talk about education! We want to educate men in the dental profession up to the proper consideration of the moral obligations under which they rest.

Let us have a uniform law, but let us be kind and good, and encouraging to the young and the poor men, and help them; for God knows we have not got enough dentists in this country. There is a fear in the minds of the dental profession that we are going to be overrun. We have not got enough dentists in America. This is no "pent up Utica." Dentistry means something to America. We are passing all other nations. America can make a better dentist in three years than all Europe can in ten. She has done it. She has made the best doctors in the world, and the best lawyers in the world. Mr. Gladstone nearly a quarter of a century ago in the British Parliament said, "Look at America, she will pass you in a canter." We have already done so.

DR. STOREY: I do not propose to charm you with the eloquence of a Crawford, but I do propose to ask my friend Dr. Stocton if the principal instructed the young man how to put on a canine tooth or a cuspid instead of a bicuspid? Did he show him how? If he did, then I should say, the young man was capable of practicing dentistry even in New Jersey, for he had learned everything else except that one thing.

In the matter of dental laws and dental examining boards I am glad to see that the American Dental Association has taken a high stand. It affords me a gratification I have rarely experienced, for it is on the right track. Coming as I do from the grand dumping ground of the United States, where all the dental garbage of the world is thrown upon us, where no law can be enacted that is originally gotten up by any man who puts on a clean shirt twice a week, I realize the real condition of things. We have a law in my State which says that the judge of each Judicial District shall appoint a Dental Examining Board, to consist of three reputable dentists, the judge to decide upon the reputability of those dentists. There are forty-seven Judicial Districts in the State of Texas. Three times forty-seven would be 141 reputable dentists to constitute the examining board. I assert without the fear of contradiction that there are not half that many in the State of Texas. If we could secure a uniform dental law in the United States, one that would cover the ground and be equitable and advantageous to us all, it would be the grandest achievement that the American Den-

tal Association has ever set on foot. In the matter of dental education, what a commentary these dental examining boards are upon our dental colleges. I suppose there were probably seven or eight hundred men graduated last term from the colleges. I think the language used in conferring the degree is, that they are constituted Doctors of Dental Surgery with all the rights and privileges—to do what? To go before a dental examining board and ascertain whether they are competent to practice dentistry. If I were a member of a faculty I would resign immediately when the first examining board was appointed and one of the students that I had passed upon had to go before that examining board. I would not give two bits for any dental diploma from any dental college in the United States if it only allows me the privilege of going before a dental examining board and being examined, in all probability by men who had never seen the inside of a dental college, or a medical college either, and who are as innocent of a knowledge of the great fundamental principles which underlie the science of medicine as ignorance well can be; who have been appointed to office rather on account of political preferment than scientific attainment.

These are facts. I am not guessing at anything. Political preferment, instead of scientific attainment, gets them upon the examining board, and men, as my friend Dr. Brown said a while ago, men who have forgotten more than the boards ever knew have to go before those boards, though carrying two or three diplomas, to be examined. There is great injustice in these laws, and unless we can manage to unify them, I suppose they will always exist. But a progress in that direction has been made in the American Dental Association to-day, and I hope that it will succeed in correcting the evil, and that a conference can be secured throughout all the States and with our members in Congress. I could not do anything in our legislature, because it is a regular Hayseed, and it won't do anything; but if we can get the matter before Congress in the proper shape, it will be a national cause. You cannot get forty-nine States to agree to anything. They will say to you what suits New Jersey does not suit Texas, even if it is a law regulating a profession. But I think the whole of dental legislation is a grand mistake. If a diploma from a dental college means anything at all it means that the holder is competent to practice dentistry. I am democratic enough in my views to allow anybody to practice dentistry who wants to, though I think the better he is educated the

better he is prepared for it; but a diploma from any dental college should be a pass-port to any man who carries it into any State. The dental colleges should place their standard high enough. Time should not be the requisite for graduation in any school, but knowledge. Let the schools place their standard high enough, and when the student reaches it, and satisfies the faculty that he has reached it, give him a diploma; but do not give it to him until he does reach it, though he may have grown gray in its pursuit. Then that diploma should be a passport to him anywhere. You will have no use for dental examining boards. You will have no use for all this talk we have had to-day, for then we would all pull together in unity. The barn-door advertisements that I see constantly in my State, by which they advertise "to extract teeth without pain, gold crowns for fifty cents," and all that sort of thing, often contain something like the following: "Graduates of the Baltimore College; graduates of the Philadelphia Dental College; graduates of the Cincinnati College; graduates of the Vanderbilt University, all work for me in this office."

DR. ALLPORT: My friend Dr. Storey says that a diploma from any dental college should be a passport to practice dentistry anywhere. So it should be, and were all of our dental colleges what they ought to be, it would be. But many of them are not, and we know it.

We know too, that a large majority of the diplomas that have been issued by this class of colleges, are no more an indication of their holders' qualifications to practice dentistry, than would be so many pieces of brown paper. And it is well known too, that many of the teachers in these colleges are not qualified to properly practice what they assume to teach. It is necessary, therefore, that we have these State Dental Examining Boards, whose duty it is made to inquire into the quality of teaching done in our respective colleges and determine as to the significance and value of the diplomas that they issue, as well as to the qualifications of those not graduates who propose to enter upon the practice of dentistry in our respective States.

Were it not for these boards the diplomas of one college would be of the same legal significance as another. Take, for instance, the State of Illinois. In the city of Chicago, we have between thirty and forty regularly incorporated dental colleges.

DR. BALDWIN: Twenty.



DR. ALLPORT: We will say twenty, then. According to the laws of our State, every one of these colleges has the same legal right to issue diplomas as has the Harvard, the University of Pennsylvania, the Chicago Dental College, or the University Dental College of Chicago, and, but for the power given to our State Dental Boards to determine as to the respectability of these respective colleges, the diplomas of any of them would give their holders the legal right to practice dentistry in the State of Illinois.

Under the general incorporation law of Illinois the requirements to obtain a charter for a dental college with the right to issue diplomas of qualifications to practice dentistry, are for three men to band themselves together and send three dollars to our Secretary of State and ask permission to incorporate and organize a dental college. A permit will be returned, no matter whether the proposed incorporators know anything about dentistry or not.

Our State Board is the only protection that the people have to secure them against graduates of these dishonest concerns, and honest colleges should regard our State Dental Boards as their best friends.

Could we have a unification of the dental laws throughout the different States, as has been suggested, it would no doubt be a good thing, but so long as each State acts independently of the others, I do not see how this can well be secured through the State Legislatures, nor could it be done by an act of congress, for the constitution of the United States gives to each State the right to regulate all such matters as it deems fit. But our National Association of Dental Examining Boards can, by agreement between the various State Boards, make themselves almost as powerful and useful as would an act of congress or a unification of our State laws upon the subject.

I can see, as Dr. Brown says, that in some cases it would be a seeming hardship for well known qualified practitioners to be obliged to be examined by a State Board, before they could practice in a particular State. But for the good of all, such a law is not without merit, for no one should be allowed to practice in any State unless the State Board was satisfied that they were qualified to do so. But no sensible board would deem it necessary to enter into a critical examination of Dr. Atkinson or Dr. Storey before allowing them to practice within their State.

The law only requires that the State Board shall be satisfied

that applicants are qualified to practice, and no need for an examination exists when the applicant is known to be qualified. It is not always the letter but the spirit of the law that should be complied with.

In reference to what Dr. Noble has said about urging our representatives to vote for the bill now pending before congress to regulate the practice of dentistry in the District of Columbia, it seems to me that it would be a very good thing to do, and I would be willing to do what I could in that direction. But it has occurred to me that a better thing would be for this association to pass a resolution requesting congress to pass the bill now pending before it on this subject. It seems to me that a resolution of this kind from the American Dental Association could but be treated with respect and consideration.

DR. GODDARD : I am greatly in favor of unification of dental laws. I do not know that it can ever be done except by an act of congress. The attempt has been made to secure a universal dental law. Several years ago the National Association of Dental Examiners framed a law and sent it to the different states advising that this law be adopted. The law we had passed in California is almost exactly the same as that devised by the National Association. There can, however, be no unification of dental laws by State legislatures, because our ideas grow. Since that law was devised by the National Association of Examiners, our ideas have grown ; more is wanted than was wanted then, and laws that have been passed in other States since that time are in advance of our law. I see no way of getting a uniform law except by action of the United States Congress. The interpretation of the law lies with the State Boards of Examiners. The Boards have the power in some States to grant licenses to those who have diplomas from reputable colleges. That is the condition of our law. All others must be examined. The severity of the examinations rests with the State Board. Some complain that the State Boards have raised the standard too high, when they insist that all graduates must be examined. Our State Board seems to have been rather too lenient in granting permanent licenses to students in actual attendance at colleges.

THE PRESIDENT : The subject of the unification of the dental laws has been turned over to a committee. The subject before

the association is dental education, and the papers that were read last night, instead of the unification of the dental laws.

DR. P. T. SMITH: The paper that was read by Dr. Atkinson, goes into a deep substratum of mental growth; I may say too far beyond our comprehension to grasp readily and favorably; yet the greater strain we place ourselves under for the reaching of these beneficial forces and conditions, the faster we will grow mentally, therefore I very much approve of such papers being read. The paper that was read by Dr. Thompson, was full of acceptable science and euphonious beauty. To the lover of science and literature it met the full measure of high expectations. It was a lullaby to the listening enthusiast; but there were no doubtful borderings invaded, no uncertain hypothesis ventured.

While we are in the youth of our profession we must recognize this duty for ourselves—that we must be aggressive. Let us take Dr. Atkinson's position. He aims to establish something that is at the foundation of the whole study and acquirement that we need. It reflects the root and support of science, and unless we have the basal principles shown and digested, how can we build our house? Without these our superstructure must fall. We should encourage a more close attention to the mental conditions of mankind. We represent simply a manipulating quality as dentists; we ask questions as to the principles underlying all of our operations to get at the best methods that we can. What gives the shock? What gives mal-development? What causes the difficulties that beset the suffering people who apply to us for our assistance? Not one of these questions can be intelligently answered, because we in the first place have not gone deep enough; we have ignored the basal principles that underlie our art.

There is a duality existing in mankind which we ought to study. The operation of mental forces is beyond our reach. We have never yet pretended or expected to invade that great field that is so hard to comprehend, but we cannot educate people except through this force. We have to make ourselves acquainted with it and to understand the domain of the two fields. If we could live according to the harmony that is prescribed by the closest investigations of this metaphysical force, we would have no disease. This is not an eccentric idea, it is simply a fact that science will bear us out in and is something that we ought to understand. If we study the text books of to-day we are kept within the small circle of the



physical organism, and if we step outside of that we are hooted at, and do not dare to go any further than we have been taught. We must open up new fields and reach over into that which we call the unknown, in order to prepare ourselves for the next higher step.

In the formation of organic bodies we have, as I said, a duality, and no substance can grow, even a mineral, without there is a positive and a negative force to operate together, and it is by these means that we have the most complex structures produced, and it is the composition of the elements on both sides that produce the results observable.

(The speaker illustrated upon the board his theories in reference to the positive and negative forces).

If you have a healthy physical organism you must have the proper physical surroundings, and you cannot have a proper physical development unless you have a favorable mental condition—the two elemental substances harmonizing exactly in their combination.

Dr. TRUMAN: The subject of discussion this morning is to my mind one of the very greatest importance. Certainly no other could claim the attention of this association of more value. We are at the present time, in my judgment, in a transitional state. We are passing from the period without law to that when we are likely to be governed, and in a measure to be injured, by law. The members of this profession must remember that there is danger in tampering too much with legal processes. There is a risk not only to this profession, but there is a danger to the liberties of every individual in this country. Those of us who have had the iron enter our souls under the old effete governments of Europe, know very well what it means to be ground down by enactments, and law necessarily is as much of a monarch as a king on his throne. It is time for us to think of these things.

I am not opposed individually to dental laws; but when they are as we have them, the request for their unification becomes imperative. If there is a law, as has been stated, in one State, that requires of every individual, whether he be a graduate or whether he be not, whether he has been in practice twenty-five years or one, that he must go before a board of examiners and pay a fee of twenty-five dollars for that examination, before he can practice dentistry, it is time we called a halt in this matter. (Applause).

It will never do to take that position. Laws, as has been well stated here, are for the benefit of the people. When they become

tyrannical and insist upon having us do more than we can possibly attend to, then it is best they should be repealed. Having been an educator for many years I am naturally brought in contact and in sympathy with students, and I am not prepared to assist in making it so difficult for them that they will be unable to enter the profession except they go through a course that will really be an injury to them.

What is the difference between the general modes of education? We are passing into another system of training mind. We are obliged to accept the world as described by Dr. Thompson in his very able paper, which I cannot regard in the same light as viewed by Dr. Smith. The writer struck some profound principles in educational matters. It is true that we have had a great deal of the didactic in teaching. It is very true that professors may have repeatedly delivered lecture after lecture, year after year, from manuscript as originally prepared, but that this is a wrong mode needs no argument. There will never be much accomplished by placing an iron partition, as a written lecture, between teacher and student. Every one fitted to train students should be able to stand before them and explain the principles as he understands them, and if he is not capable of thus doing he is not fitted for the position which he has been called upon to occupy. Therefore, every year makes a change in educational methods. I believe the time is coming when, instead of didactic lectures, we will have practical demonstrations of scientific results, and that the "mere talk," as it has been called, will be laid aside for the clinical demonstration. For more than a quarter of a century I have been a lecturer to students and am convinced that a more practical way is desirable and would be welcomed by myself.

In reference to technicalities: There is a certain class of scientific men, and I have no criticism to make against them, who in their dealings with their special work so overload the matter with technical terms that they can never be clearly understood, even by those who are equally as advanced as themselves. To my mind the one who is the best teacher is that one who reduces everything to the simplest possible terms, omitting wherever possible technicalities. I know very well that I have been subjected to criticism both in this country and in Europe for this position; but I believe it can be maintained that if you want to instruct students you must do it in the simplest way, bringing your work before them in the

plainest English at your command. I think that this course should be followed in all our text books.

The Chairman of the Section called attention to a work in preparation, a portion of the advanced sheets of which I have had the greatest pleasure in reading. I allude to Dr. Farrar's work on regulating. I want to say just here that in my opinion dentistry has never yet produced a work equal to it, and it will be many years before anything like it can be accomplished. It shows what one devoted man can do. He has given the last six years of his life to the subject, day and night, and the result when issued will be of incalculable benefit to the profession. Every dentist should have a copy of it without regard to cost.

Educational labor is the important work of the period. We need not only more to write, but we want men to attend these meetings. What a paucity of members do we find here, large as the numbers are, for a great profession. Some of us have come almost half way across the continent, and I should have regretted it had anything prevented my being present.

Now, gentlemen, we want to be liberal. We do not wish to be dogmatic. We do not desire to crush any one by law. We want a certain degree of freedom of action in our educational movements. Colleges are being constantly criticised and the assertion is being made over and over that they turn out poor or unequal men. That is not the way to meet the subject. Give us your assistance and encouragement and I am satisfied that within the next ten years you will see an advance along the whole line of dental colleges that will surprise every man in this profession.

DR. ATKINSON: There is one thing that I think it would be well to study and that is the practical way of getting at our work. The prime effort to be crowned with success in all dental investigations grows out of respect for each other in our investigations, and the ignoring of all the littlenesses that are so sure to divide men, or at least to consume their time unprofitably. I have noticed that many have been so listless as not to have given attention enough to their own mental process to know which side of a question they were on, or whether they have comprehended what the nomination of the question involves; and we observe this in very sharp men sometimes. Laying themselves under the ban of what Paul says, "He that answereth a matter before he heareth it, it is a shame to him." That was exemplified when the blackboard was



called for to-day, and I am sure that we need points of agreement as foundations for our investigations in any subject; in other words we want foundation principles so fixed in our mind and formulated that they can be shortly stated, and that has been the effort of our investigators from the earliest time until now, under the ban and assumption of knowledge on the part of those having the field, out of which, thank God we are growing. We are not bound now to point to our authority, among real naturalists or true investigators in any department of scientific research, for we take it for granted that all those who have got enough illumination and growth in themselves to have the desire to know, have had their strength developed and retained so that they state propositions that are satisfactory to their own minds with such confidence that others will see and agree with them.

DR. PEIRCE: The section has no further report as a section, but with your consent I would like to say a few words regarding a matter embraced therein and already submitted. In the report presented this morning there is a paragraph making allusion to the formation of a committee whose province it should be to suggest some method to this association by which we might offer some inducement or stimulus to our younger members to attain a position higher than that covered by the degree of D. D. S. I believe very firmly that we would make an advanced step by having formulated some method establishing a fellowship, it may be, to secure which would be an inducement for the students in our profession to devote themselves to scientific labor, so that the profession would be benefited by their higher attainments. I wanted to call attention to this so that the association might consider the subject and if they think it feasible, take some action upon it.

DR. PATTERSON: There was one suggestion made in the discussion this afternoon, which seemed to me a very good one; it was in regard to reports from societies, and in order to give it more prominence I will introduce a resolution. It seems to me that this would be one of the most useful plans the association could inaugurate, so I offer this resolution: that the societies sending delegates to the American Dental Association be requested to instruct their delegates to select one of their number who shall compile a report upon the original work of their local associations each year, and bring such report before the proper sections in this association.

DR. CROUSE: There will be a report from the executive com-

mittee by and by, requesting the society to instruct somebody, probably the executive committee, to send a communication to all local societies, and perhaps the entire dental profession, on this very subject of sending reports and getting them nearer to us. This will involve the expense of postage, and so forth, and I did not think it was best to do this on my own responsibility, but I am going to ask the association to do it. I am satisfied that good can be accomplished in this way, and this resolution might come in, in connection with my proposition.

DR. PATTERSON: My purpose was only to call your attention to that which I consider the best means of bringing the matter up. I am willing to withdraw the motion and do it with pleasure.

DR. H. A. SMITH: I was quite interested in the report of Professor Peirce, that portion particularly which referred to the establishment of some institution in which a degree in addition to the D. D. S., might be conferred. I would have been glad if the Professor had given us some views in reference to how that might be accomplished. In the prosecution of some other branches of science they have what are called academies. Could we establish an academy of dental science, and in that way bring up the standard of scientific investigations?

OPERATIVE DENTISTRY.

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By N. S. HOFF, D. D. S., SECRETARY OF THE SECTION, ANN ARBOR.

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Owing to the continued illness of Dr. E. T. Darby, the chairman of the section on Operative Dentistry, we are unable to present as complete a report of the progress made in the work of this section as its importance deserves. The brief time at our command since we were requested to make this report has not permitted any solicitation of papers, and none have been submitted by members of the section. Two papers have been referred to us from other sections, which will be read by the chairman.

An examination of the papers contributed to the dental journals and various dental societies, the discussions, inventions and time given to clinics, etc., seem to indicate that operative dentistry still continues to be the most interesting branch of dental science.

We believe it is desirable that some systematic method of collecting, classifying, indexing and recording this information should be adopted by this section; and would recommend that the work of the section be done in accordance with this or some other systematic plan, which will divide the work among the members of the section so that it may not all devolve upon one person, and thus present at the annual meeting a complete report of all the progress made in operative dentistry during the year. We had planned to make such a classification of instruments, appliances and the literature for this meeting, but found that the time was too short to complete it for this session.

The subject of filling roots, which occupied so much time at our last meeting, has, because of the interest there shown in it, received an unusual amount of attention during the year. That discussion has resulted in clarifying this subject and giving it a more scientific tendency. An excellent paper on this subject appears in the



December, 1889, number of the *Dental Cosmos*, written by Dr. A. Retter, of New York, entitled, "Treatment of Teeth Having Foul Pulp." A paper in the April, 1890, number of the *Cosmos*, by Dr. W. D. Miller, on the "Action of Peroxide of Hydrogen Upon the Teeth," is of considerable interest in connection with this subject. Dr. C. N. Peirce has made some experiments with peroxide of hydrogen, the results of which he will detail when the discussion of this report occurs.

Two additional materials for filling roots have been suggested in addition to those mentioned in the discussion last year. One, red cedar saturated with parafine, suggested by Dr. James H. Beebe, in the December, 1889, *Cosmos*. The other is beeswax, suggested by Dr. B. F. Arrington, in the March, 1890, *Dental Cosmos*.

Dr. Taylor, of Hartford, suggests dropping chloroform into the root canal and then dissolving the gutta-percha in it by agitation with an instrument, thereby causing the gutta-percha to settle to the end of the root canal. When the solid cone is forced into place the canal is more certainly filled to the end.

Dr. W. S. How has devised a set of needles for use in making dressings and conveying filling material into small and tortuous root canals. These needles are graduated so as to prevent forcing the materials beyond the apical foramen.

A valuable paper on the comparative value of the various antiseptics used in the treatment of diseased teeth is published in the August, 1889, *Cosmos*, by Dr. W. D. Miller, which, though perhaps belonging to another section, is of so much importance to the operative dentist that we wish to call attention to it.

Nothing of special importance has appeared during the year relative to operative treatment of pyorrhœa alveolaris.

For the treatment of sensitive dentine, Dr. J. W. Holt suggests the use of the actual cautery, applying heated instruments directly to the part. Dr. Dwinelle suggests the use of chloride of zinc powder in connection with the cautery. Dr. Rhein is still investigating chloride of methyl, and reports the most satisfactory results from its use, and so far has had no experience that would suggest his abandoning it. The numerous efforts made to secure painless operations on the teeth have given us many methods and remedies that accomplish this in such degree as to render tolerable many operations that would otherwise be unbearable, still we are unable

to report at this time any reliable method or remedy for this troublesome accompaniment of operations on living teeth, which is entirely harmless to the delicate organism of the tooth, or is unobjectionable in its application.

In the operation of filling teeth there is nothing new to report as to methods. It seems that the long discussion of former years as to superiority of methods had either exhausted this subject or the conclusion had been reached that there was no method upon which all could unite and thus establish a universal method of practice. We do not, however, believe that the time will never come when there will be a united practice. We hope for the time when the investigations as to the cause of caries of the teeth and the dissolution of filling materials shall result in precise knowledge. Then we will learn how to combat the influence of these deleterious agents, and be able to supply a filling material that will resist all dissolving agents, and methods of manipulation will be simplified and definite. Let us then encourage our workers in Histology, Bacteriology, Organic and Physiological chemistry and dental medicine.

In the way of filling materials, R. S. Williams has brought out during the year a new form of crystalloid gold for contours and general use, which many operators are using with great satisfaction. It is particularly valuable for starting fillings. Mr. Williams has also made a new line of gold cylinders which are calculated to combine all the excellencies of the many varieties now in the market in one, and at a lower price. Dr. Carroll, of New York, is making an aluminium foil for filling teeth, but we have no report from any one who has used it. Dr. C. B. Parker, of Brooklyn, suggests the use of amalgam alloy mixed with oxyphosphate of zinc as a durable filling material. Dr. Dwight M. Clapp, of Boston, makes a combination gold and amalgam filling. The filling is started with amalgam, then Steurer's plastic gold is added, and the finish made with any form of cohesive gold desired.

Not so much is being said about the excellencies of copper amalgam as there was a year ago, and no new make that is superior to all others has been put on the market during the year. Whether this material has failed to meet the expectation of its friends, or proved so satisfactory as to thus quickly establish itself, we have no means of determining. Dr. W. B. Ames advises the use of what he terms extra dry amalgam, or amalgam containing

less mercury than is required to render the amalgam sufficiently plastic for use. This amalgam is heated and mashed to a powder in the mortar and a solution of nitrate of mercury added and the mass triturated until it becomes of the proper consistency for use. The claim is that there is no excess of mercury and no subsequent wasting away of the filling which occurs with other amalgams.

Inlay fillings continue to be popular. Dr. George H. Wiegant, of Canada, has devised a set of diamond trephines for cutting out sections of porcelain from such portions of the artificial tooth, either plain or gum, as will give the desired shade and, if wanted, the gum festoon. Dr. S. D. Rambo, in the *Dental Cosmos* for March, 1890, describes a system for restoring corners or sections of decayed or broken teeth, with gold plate bent to the desired contour and secured with cement and pins soldered to the inner surface of the gold facing and reaching into the pulp canal or pits and grooves made into the tooth. White vulcanized rubber is also suggested as an inlay. It has the advantages of harmony in color, ease of adaptation, and capacity for a quick and high polish. It can be set with cement or chloro-percha, or into many cavities it can be warmed and pressed without an intervening cement.

The S. S. White Dental Manufacturing Co. have introduced a new cord dental engine, which promises to be a valuable improvement of the old suspension engine. It is the Bonwell engine with the Weber-Perry improvements. This company also introduces a new gasometer for use in administering nitrous oxide; a set of fissure chisels for use in the molar crown cavities, devised by Dr. W. S. How; a set of root canal drills by Dr. Littleton, and a set of root canal fillers by Dr. W. S. How. Messrs Hood & Reynold, of Boston, have invented a new dental chair modeled somewhat on the plan of the Morrison, with improvements that admit of easy rotation and elevation. J. W. Ivory has introduced a pair of molar clamps for the third molar that are decidedly well adapted to the teeth. He also has a new nerve broach that is novel and will doubtless prove useful; it is a spiral and acts on the principle of the cork-screw.

Dr. E. C. Moore, of Detroit, has devised a set of metallic racks for the purpose of containing and classifying instruments in the drawer of the case or bracket, which will prove a great convenience to the busy and methodical operator.

Dr. Letord, of Kansas City, presents a double-faced mouth mirror



which is useful in obtaining access to the buccal cavities and reflecting the light into them.

Dr. H. H. Knapp, of Jackson, Mich., has devised an apparatus for holding a mouth mirror and a large magnifier in place, at the same time holding the rubber dam or napkins in place, and steadying the lower jaw during operations on the lower teeth, allowing the operator perfect freedom to use both hands in operations.

Dr. Jno. L. Gish, of Jackson, Mich., has invented an improved rheostat, for controlling the electric current and making it applicable as a therapeutical agent in the treatment of diseases of the mouth and teeth. Chas. Mayer, of Springfield, Mass., has devised a set of test papers for testing the purity and efficiency of dental medicines.

## OPERATIVE DENTISTRY.

### ABSTRACT OF TWO PAPERS.

ONE BY CHAS. B. ATKINSON, D. D. S., AND ONE BY J. L. WILLIAMS, M. D.,  
BY A. E. BALDWIN, M. D., D. D. S., CHICAGO.

Two papers were referred to this section by other sections, and to the writer was referred the task of presenting an epitome of the salient points of each.

The first is upon medicated oxyphosphate fillings, by Dr. Chas. B. Atkinson, of N. Y., in which he advises, after an experience of two years, in capping exposed pulps, the admixture of various medicaments with the filling material. The medicaments used are: 1, creosote and oil of cloves  $\overline{aa}$ , 2, eugenol, 3, deliquesced carbolic acid, 4, oil cinnamon, 5, oil of cloves, 6, creosote pure, 7, creosote, oil cloves  $\overline{aa}$  and iodoform, 8, creolin, 9, campho-phenique, 10, potassium chlorate powdered, 11, salicylic acid, 12, camphor pulv., 13, stick sulphur pulv., 14, iodoform, 15, oil of wintergreen.

The principle of medicinal action of the mixture is the principle that upon the crystallization of the oxyphosphate, no further change takes place, hence the medicament may exert some of its remedial action. He employs mostly the 1st mixture—creosote and oil of cloves. When the medicament is a *liquid* he adds about an equal quantity of medicament and phosphoric acid, and when a solid, about equal parts of medicament and oxide. These proportions may be varied as required. He believes in this way the remedial agent is constantly exerting its effect on the walls of the cavity, being especially valuable at the gum margin, thus resisting germ action, and also producing in the teeth, increased hardness and increased resistance to thermal changes. He from his experiments thinks that the first seven have been fairly tested and are about equal in durability, manipulation and time of setting—setting in about 10 minutes. He has made no effort to control color. His practice is to freely excavate, even to the surface of the pulp, and remove almost





In the abstract of Dr. Chas. B. Atkinson's paper on Medicated Oxy-Phosphate Fillings, it is stated that "he always, in capping pulps, covers the exposure first with a mixture of oxide of zinc, creasote and oil of cloves." Dr. Atkinson desires the following correction to be made:

"I expressly state in my paper that the medicated cement is placed directly over the exposure *without* any intervening substance."

PUBLICATION COMMITTEE.

all or all of infected matter in the cavity. He employs this system farther in retaining inlays—setting retaining appliances in pyorrhœa cases—setting crowns, and in temporary repair of artificial dentures, i.e. in setting isolated blocks or single teeth in rubber or gold dentures. He always in capping pulps, covers the exposure first with a mixture of oxide of zinc, creosote and oil of cloves, and adds remedial agents to the oxyphosphate filling whether in capping exposed pulps from caries or accidental exposures. Also uses the same agents in pulpless teeth.

The second paper is entitled "a few words on corrective, preservative and obtundent treatment of the teeth," by Dr. J. L. Williams, of Boston, Mass., in which he says that as early as April, 1856, in "Am. Jour. of Dent. Sciences," he gave his treatment of teeth where pulps were endangered but not exposed, the main idea being the saturation and sealing of the cavity with non-irritant corrective and antiseptic applications, unsealing and repeating when necessary; mild applications being more successful than stronger. His experience to this time bears out these principles, recognizing that nature only requires mild help in removing diseased conditions, and that the reparative processes are hers.

In obtunding, the writer maintains that the treatment should be a gradual preparative treatment. At the time mentioned (1856) known antiseptics were comparatively few. The writer then used oxide of zinc to stiffen the gutta-percha, a method which since then has become well known. He often uses in checking fermentative action in deep-seated caries, a simple obtundent; a sol. of calcium chloride. However, the great object should be *not* to see how much nature will bear, but to know how she works, and to assist her. The writer claims to be the author—historically—of the first systemized plan favoring the deposit of secondary dentine, and of obtunding sensitive dentine, and of the first use of oxide of zinc mixed with gutta-percha for a plastic stopping; Hill's Stopping, a prior and patented preparation having no oxide of zinc, but sulphate of lime to stiffen it.

## DISCUSSION.

DR. PEIRCE: The use the of peroxide of hydrogen is, I judge, familiar to all the profession. It has been very successfully employed for two or three years at least in removing from cavities the products of decomposition. It has also been employed in the

cleansing of teeth, or freeing them from the various stains which are liable to be found upon their surfaces in children or adults where there has been a lack of care in cleansing. It occurred to me that we were not thoroughly informed as to its action on the tooth structure. It has been stated on several occasions that a tooth immersed in this fluid would become decalcified, and possibly in a similar condition to one placed in an acid. On the 7th of July I placed a bicuspid largely excementosed in a drachm and a half of the liquid. It remained twenty-four hours, when the liquid ceased to act upon it, and in the bottom of the vessel were flocculi, showing that we had the organic matter of the tooth destroyed, or apparently in solution, and the lime precipitated at the bottom of the vessel. The tooth was again placed in pure material and the same action took place. This was repeated every twenty-four hours until the abnormal growth, together with the cementum of the tooth, had all been removed, and we came down to the dentine proper. The same method was continued, but the action was much slower. The disintegrating influence of the liquid upon the dentine would not be exhausted under forty-eight hours, or even longer time, showing that the action upon the dentine was much slower than upon the cementum. In the dentine we had a less proportion of organic matter and a much greater per cent of lime; therefore the deposit or precipitate at the bottom of the vessel was much less after the cementum had been removed than while it still remained.

The tooth remained in the liquid, which was changed at first every twenty-four hours and afterward every forty-eight hours, from the 7th of July to the 27th, at the expiration of which time the root had been reduced in size fully two-thirds and was quite transparent and perfectly smooth on its surface. There was no softening, which indicated that the organic matter had first been decomposed, and the salts of lime left as a precipitate at the bottom of the vessel. I brought it with me, but the liquid has become so disturbed in transit that it does not show as it did while it rested upon my mantle. I desire to bring this question up with this statement, because I have had no definite information regarding the action of this fluid upon the teeth and I doubted that it was similar to that of an acid.

DR. BROPHY: Before making the experiments it seems to me Prof. Peirce should have neutralized his preparation, for it is well known that sulphuric acid is added to the per-oxide of hydrogen to



prevent its decomposition, and the preparation that was used by him I presume was decidedly acid in its reaction. If it had been neutralized it would not have been possible for it to disorganize the tooth in the manner that he describes.

DR. RHEIN: I have tried experiments on lime deposits on the teeth outside of the mouth, using Marchand's preparation, which is supposed to be free from all acids Dr. Brophy speaks of. The masses of calcareous deposits that I used were very large, so that there was still quite a quantity of it left undissolved at the conclusion of the experiments, but that it had a dissolving effect upon the deposit was unquestionable. From practical experience with it I believe it has value in these cases, and I would like to see it investigated in that direction.

DR. PEIRCE: If the preparation had been acid, as suggested by Dr. Brophy, I am under the impression that the salts of lime would have been held in solution and not have precipitated to the extent it did. If we place a tooth in chromic acid we do not have a precipitate of lime; we have the lime taken out and in solution, while the organic matter remains intact and the tooth flexible.

DR. HARLAN: The question of the effect of acid peroxide of hydrogen upon teeth is one which has received little attention. Peroxide of hydrogen, as it is prepared by the manufacturers in this country, at least from all the tests that I have made, presents a decided acid reaction. Peroxide of twelve volumes or fourteen volumes strength should be absolutely neutral, and the only preparations that I have ever been able to obtain that were neutral were Trommsdorf's and Schuchardt's. If peroxide of hydrogen has no acid reaction, it should have no action upon the teeth. If it possessed a decidedly alkaline reaction it would act upon the matrix and allow deposits of the flocculi, such as Prof. Peirce has described. So if you wish to use peroxide of hydrogen, be sure that you get that which is entirely neutral in reaction.

One point spoken of in the report of the secretary of the section I wish to emphasize, and that is with reference to the use of vulcanized white rubber inlays in buccal cavities of molars or of bicuspid. Last year while in Europe I saw a number of specimens that had been prepared by a gentleman from Naples. He used the English white vulcanized rubber. This was vulcanized very hard and would receive a most beautiful polish, and if the teeth were dull in appearance and the enamel partially worn away, that surface could

be finished so that it could scarcely be detected at any distance from the patient. This is not only a cheap, but a serviceable method of introducing an agent for the filling of teeth that will not be a conductor, as it is well known that one of the objections to rubber as a base for artificial dentures has always been that it was a non-conductor of heat, and hence injurious to the soft tissues.

DR. AMES: With reference to the action of peroxide of hydrogen containing an acid upon dentine, it seems to me that Prof. Peirce must be in error. While in the solution of dentine by chromic acid of which he speaks, there is no precipitate because the *chromate* of calcium formed is soluble. If the solvent be sulphuric acid contained in peroxide of hydrogen to prevent its decomposition, the *sulphate* of calcium formed would give a precipitate because it is very slightly soluble.

DR. STUBBLEFIELD: The older, ordinary, commercial peroxide of hydrogen is derived by the action of hydro-chloric acid on barium di-oxide. If in this combination there is an unequal portion of the two ingredients there will be remaining some of this hydrochloric acid, and the acid reaction which is observed will be easily determined by a very slight analysis to be due to hydrochloric acid, and I deny the statement that sulphuric acid is ever added for the purpose of preserving the hydrogen peroxide from loss of the loosely combined oxygen. I never heard of such a thing until very recently, when I saw the statement in a dental journal, and at the time it occurred to me that it could not be so, as stated.

With reference to Prof. Peirce's experiment, it seems to me that dilute hydrochloric acid with pumice would make a better cleansing application than peroxide and pumice, because the rapid evolution of the oxygen, when the peroxide is exposed to the air, would only leave  $H_2O$  which is water. I meant to say something with reference to his experiment upon that tooth. The hydrochloric acid would dissolve the lime salts, though but slightly. In the case of combination with organic products you might readily have a flocculent precipitate, which might be mineral matter. In fact I would not express an opinion as to what that is until it was examined. It does seem to me that it would not require very close analysis to ascertain the difference between the two as to whether it was due to the alkalinity—saponification—or whether it was a union with the mineral matter and the organic matter together, as I

think is most likely the case, and this deposit might be a kind of flocculent precipitate that was formed of a combination of the two and not strictly one or the other.

DR. PEIRCE: If the doctor places a tooth in hydrochloric acid, which decalcifies it, does he not find on the surface of that tooth organic matter remaining, which was what held the lime in position?

DR. STUBBLEFIELD: I would find the organic frame work of the tooth, certainly, modified by the chemical action.

DR. PEIRCE: In no one instance, when I removed the tooth each day or every other day from the stale material to the fresh, was there the slightest softening on the surface, but it was smooth and hard.

DR. STUBBLEFIELD: If you left it long enough it would remove that outer layer. If you let the action take place a while and put it under an ordinary magnifying glass I think it would show you whether that surface was perceptibly rough. It would in fact be rough.

DR. BROPHY: In answer to the criticism made by the gentlemen as to the addition of sulphuric acid to peroxide of hydrogen I would say that I did not come to the conclusion by experiments made by myself but accepted the statement of a chemist, whose knowledge of this matter I would not question. I believe the gentleman made the experiments and knew whereof he spoke, and the gentleman who has last spoken I think does not claim that he has tested it, but he is inclined to believe that sulphuric acid has not been added. It would be well I think to have a test made to determine the kind of acid that is present in peroxide of hydrogen.

DR. CONRAD: Judging from the remarks of some of the gentlemen who have taken part in the discussion, it seems to be a question with most of them as to whether sulphuric acid is found in the preparation of hydrogen peroxide most generally used by dentists. So far as I have been able to learn, this acid is placed in most all hydrogen peroxide sold, in order to aid in its preservation. I not only find it of use to preserve the preparation from decomposition, but I consider the addition of sulphuric acid makes this agent of greater value when treating diseased conditions of the mouth. When I wish to treat a case with dilute sulphuric acid, it is not an uncommon practice for me to add a few drops of the acid



to the hydrogen, expecting from this mixture better results than from the acid or hydrogen alone. The specimen presented by Dr. Peirce does not seem to have been as badly injured as we would have been led to believe, from his remarks. To me the tooth has only been thoroughly cleansed by the hydrogen peroxide.

DR. HARLAN: In order to furnish further historical evidence in this connection, I will make this statement: In some chemistries treating of peroxide of hydrogen, it is stated that a small quantity of sulphuric acid is added in order to prevent the decomposition of the peroxide of hydrogen; but I believe it is true that in the process of manufacture if it is made by the action of hydrochloric acid on barium dioxide, that the presence of hydrochloric acid may be found, but Trommsdorf and Schuchardt, and perhaps Morson, have been able to completely neutralize the hydrochloric acid, and hence their products are neutral.

DR. ATKINSON: I am very much pleased with the trend of these investigations. When we are speaking of chemistry, we want to be very careful as to arriving at our conclusions. When first using peroxide of hydrogen I thought I had found a bonanza; that I had as I called it, my washer-woman to wash out all the highways and byways of degenerated tissue and degenerated fluid, but in the course of investigation I learned that the bubbling was not confined to diseased territories, but that perfectly healthy mucus and saliva and blood would foam with the same apparent vigor that pus, sanies and ichor would foam, so that it set me a little off my base; and in connection with the manufacturer who operates under patents granted him by the United States and France, the study of the easy disruption of the molecules of  $H_2O_2$ , leaving the last measure of oxygen to go to its nearest affinity, did, as Dr. Stubblefield suggested, leave us nothing but  $H_2O$ ,—common water—to which we could not attribute a very great and energetic chemical clearing up of the territory.

I am somewhat embarrassed because of a mishap or delay of some kind of the express company. I have en route a package with the latest pamphlets of Charles Marchand, who presented them to me to be presented to as wide a range of teachers in dentistry as might be, and I wished to distribute them here at this time. Not having arrived, I do not know whether I shall be able before the close of the meeting to distribute them. The package contains glycozone and peroxide of hydrogen. As to the glycozone I have

had considerable experience with it, and for quite a term of years, longer than the length of time named this evening for the peroxide of hydrogen, and the difference between the glycozone, which is of fifteen volume condensation of oxygen in glycerine, and the peroxide of hydrogen is, that the bond of affinity in that molecule is stronger than it is in the peroxide of hydrogen, and necessarily gives us a much more potent germicide wherever we can carry it into the immediate deteriorated neighborhood. So that in conversation with Marchand, and wishing to have that test thoroughly made, the steps have been taken to which I refer. While speaking I want to say that when we get a new thing we are very apt to think that we have now got down to bedrock. I have so many times been disappointed from lack of knowledge and want of really grasping the subject, so as to know when my interpretations were satisfactory even to my own observation, much less to those who were at a distance from the experiment, that I want to enter a caveat against this crude kind of experimentation and calling it scientific and reliable. If the box arrives I will take occasion to distribute it, that we may get the tests from men who are competent to make the observations and report if it is any longer desirable for us to use peroxide of hydrogen at all by reason of the evanescent character of the hold that it has upon the extra atom of oxygen.

DR. OTTOFY: I wish to say a few words in regard to one of the papers presented by the section, that of Dr. C. B. Atkinson, of New York. He sent here a number of specimens and a very well written paper illustrating the incorporation of medicaments in temporary fillings. I think in all probability we can use these drugs to a great deal of advantage, and I have been in the practice of using iodoform, and occasionally iodoform and eucalyptol in a mixture, in proximity to the pulp and have found from it very good results. I think, as a rule, if we use some medicament of this character mixed with the oxyphosphate, we will find that the tooth afterward is generally in a better condition than when the oxyphosphate alone is used. I would like to hear those who have used these preparations speak upon this subject.

DR. BALDWIN: What effect do you expect to get from the iodoform?

DR. OTTOFY: It is preservative, as in all probability it prevents the growth of germs.

DR. BALDWIN: You believe it is a germicide?

DR. OTTOFY: I do.

DR. STOREY: I feel myself peculiarly happy to-night in being here. About two years ago or a little more we had before us the subject of root filling, capping pulps and the different materials for filling roots. I made the statement at that time that I still had one prop under my hopes that I would save a pulp alive. The tooth I founded my hopes upon had been filled for two years, but about two weeks after I got home the patient in whose mouth it was came to me and said, "Doctor, that tooth you filled for me about two years ago feels as though it were about two feet long." I opened it, took out the pulp, filled the root with oxyphosphate of zinc, (which is the *sine qua non* with me) and the crown with gold and up to this time it is all right.

About three years ago I filled another tooth, having a proximal cavity that was difficult to reach and I filled the cervical portion of that cavity with amalgam. The tooth was perfectly sound and had a firm solid base over the pulp chamber. About three months ago the patient came to me with that tooth feeling very long too. I took out the gold-filling and the amalgam at the base; the filling to all intents and purposes being absolutely perfect. There was no discoloration. But I found the pulp-chamber entirely open and containing a decomposed pulp.

There had evidently been a retrogressive metamorphosis in the tooth substance beneath the amalgam, bringing the pulp in direct contact with the metal. I removed the pulp and filled the roots with oxychloride of zinc which is all I want for root filling. If I am going to use amalgam I fill the cavity before the oxychloride sets. If there is a fistulus opening I fill at once with oxychloride of zinc, which, after nearly twenty years' experience with it, I can say has never gone back on me. I do not know of a single case in which I have made a failure. If the canals are very small the oxychloride of zinc will be a sufficient disinfectant and antiseptic to overcome all trouble even if they are not filled. Not only that but you will find it bleach the discolored tooth. I have whittled down remedies in my practice to but very few. I did use peroxide of hydrogen for a while but it did not give me satisfaction. I could only keep it a day or two where I live, and it was rather an expensive material, and I came to the conclusion that I did not have the sense to use it and so abandoned its use.

DR. PEIRCE: I have the tooth in my hand on which the ex-



periment has been made. You will see that the enamel has not been to any appreciable extent disturbed. Had the fluid been acid the enamel would have been roughened and very materially destroyed so it seems to me. It will be seen that the cementum has been removed completely.

DR. AMES: I want to ask Dr. Peirce whether after this peroxide of hydrogen had apparently become neutral, he tried it with any of the products of fermentation or organic matter to see if it had any of the properties of peroxide of hydrogen.

DR. PEIRCE: I did not.

DR. E. PARMLY BROWN: While the question of operative dentistry is under discussion, it would be well for me to mention some experiments that have been made lately which we partially reported in the first district society one or two months ago. Dr. Story has spoken of two pulps dying. Don't let any man in this dental association allow two dead pulps to stand in the way of saving two hundred. Suppose we do occasionally have a pulp die, is that any reason why we should not try to save them generally? I try to save all pulps without exception where there is any hope.

I want to compliment Dr. Atkinson and his son for bringing before this association these specimens of oxyphosphate incorporated with medicaments. We have been talking about having arrangements made for manufacturing these medicated fillings. He is on the right track as sure as you live. Supposing that these medicaments would not interfere with the setting of the oxyphosphate, we are going to put it in asbestos. This asbestos filling which I spoke of at the First District meeting is a non-conductor. We have six varieties that can be bought in New York, and none of them are worth a cent. The South Sea Island asbestos we can obtain in Europe and it does the work beautifully. It also does nicely for setting porcelain and gold crowns. We have had a great many experiments made on children's teeth, on the grinding surfaces as well as at the cervical borders, where the fillings are likely to be disintegrated by alkalies, but we have not yet examined them since they have been put in to report on them; but as a non-conductor under gold fillings the success is absolute.

DR. SWASEY: Dr. Harlan spoke of rubber inlays. I have seen some of them. They look very well but the only one that I have ever seen that I religiously stood by, was one made from black rubber. White rubber, where it is used on the masticating surface

wears out, not as fast possibly as gutta-percha, but it wears out rapidly. The inlay that I use in all large cavities for proximal and grinding surfaces I make from gold. My method is to cut a piece of proper size from a ribbon of gold rolled to about 100 to 120, and then to anneal it. A piece of cork, or erasing rubber is then cut to fit into the cavity. The piece of annealed gold is then placed over the cavity, being held with the pliers in the left hand, while the gold is burnished, with a large burnisher into the cavity. The cork or erasing rubber is then put in place and held there and the edges are then burnished down. The overlapping gold should then be trimmed off, the whole annealed again and placed in the cavity with rubber or cork in the inside. The mouth should then be closed when the pressure of the rubber will make an adjustment of the gold on the margin of the cavity. The inlay should then be carefully removed and invested. Twenty carat gold should then be cut into strips and placed in the shell and melted there. The inlay should then be tried in the cavity, and more gold added if necessary—or some of it ground out, as the case may be. When it is thus completed, slight grooves should be cut around the part that goes into the cavity. It should then be set with oxyphosphate of zinc in a creamy condition, and be driven to place by tapping with a mallet. When it is thoroughly set it should be finished, as any other filling.

DR. HARLAN: With your kind indulgence I will give you the tests of the peroxide of hydrogen that Dr. Peirce used, which I have made with test-paper. Litmus paper it turns red. With hydrate of starch test-paper, testing for peroxide of hydrogen of a strength of over 12 volumes, it must be dark blue in one minute, and if it is weak, less than 4 volumes, in the same time. With this test it was first purplish and then blue.

DR. BALDWIN: How long did it take?

DR. HARLAN: It took about a minute and ten seconds. With the potassium iodide test-paper it turned it blue instantly. That is what it should do. The strength of peroxide of hydrogen is shown by its ability to liberate iodine from iodide of potassium. With the potassium ferro-cyanide test-paper, for alkali, there was no effect whatever.

DR. PEIRCE: Would Dr. Harlan consider these tests which he has made any evidence of the condition of the peroxide of hydrogen before the tooth was placed in it, or would it be possible for

this solution to have undergone some change during the week in transit, with the heat and the motion.

DR. HARLAN: Animal matter, in the presence of hydrochloric acid, which I believe is in this peroxide of hydrogen, would not be decomposed.

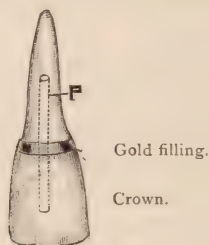
DR. P. T. SMITH: We know by experiment that it is one of the most difficult things in our practice to preserve pulps of teeth where cavities of decay have almost reached the chamber which that organ occupies. We are taught to believe that if the cavity does not reach too close to this chamber a proper filling may be adjusted which will not produce an irritation, and therefore the pulp can be preserved alive.

We know the histological arrangement of a pulp and the ramification of the tubuli from this locality. It has been a question as to what these tubuli are filled with, but we know they are filled with a fluid (if not with nerve structure) which performs the functions of nerve tissue, and whenever decay, or any accident happens to the body of a tooth, we have the destruction of the contents of these tubuli, and that of itself is a threatening danger to the perpetuity of the pulp. It is not always thermal influences arising from the presence of a filling that destroy the pulp. It is the destruction of the contents of the tubuli. When you talk about saving pulps without paying attention to the principles of harmony of mental existence, which so unmistakably endows every atom of human tissue, you have lost sight of the most important point in the effort which you are trying to make. If an arm or a limb be taken from a man a certain portion of the brain is also taken. That individual does not represent the mental power, the mental ability if he has been deprived of a limb, that he did before he sustained such a loss. It is the destruction of the elements within the tubuli that produce the danger and death of the pulp, excepting there be mechanical interference, or thermal irritation, and so forth, that come from the presence of a filling.

DR. GODDARD: Sometimes the operation of implantation is performed. I am not here to advocate it nor to speak against it, but merely to tell you how I have prepared teeth for the operation. If the operation ever becomes extensively practiced, the great question will be where to find a supply of teeth, especially of incisors and cuspids. I bring this up under the head of operative dentistry, because the operation of preparing a tooth for this purpose is much



like that of filling a tooth with gold. It is easy to find a suitable root for almost any case of implantation. A Logan crown can then be selected for the case, fitted to the root and attached with cement in the usual manner. By making a groove around the tooth with a fissure burr, between the neck of the tooth and the end of the root, and filling that groove with gold, a perfect joint is made between the root and the crown, so that decay cannot commence at that point. The gold filling can be smoothed off in accordance with the contour of the root and crown at the point of union and will present when finished the appearance of a gold band joining the two.



DR. STOREY: I want to thank Dr. Smith for his remarks upon this subject. In my observation I have found that certain teeth have died where the filling has been good for a great many years. When I have asked patients if the dentist who filled those teeth did not put something in them to destroy the sensibility, the reply has been, "Yes, it hurt so that I could hardly stand it and he put something in it to destroy it." That destruction of the contents of the tubuli went on until it reached the pulp chamber. In almost every instance I found that where there was a large amount of material between the filling and the pulp and the pulp had died, those teeth had been exceedingly sensitive, and some destructive material had been put in for the purpose of rendering them insensible.

DR. CROUSE: Were those your own experiments or did you get the history from the patient?

DR. STOREY: Some my own, and some of them had come from a distance, probably some of them from Chicago.

DR. CROUSE: My observation and my experience of twenty years in capping pulps, have been the reverse of what has been stated by the last two gentlemen who have spoken on this subject. I recognize the fact that my observation does not agree with many others, but it accords with some others or I should conclude that I

must be wrong ; and sometimes I get dejected and lose faith in myself and try some other treatment. I have made mistakes a great many times, but my practice of twenty years in capping pulps has been a very satisfactory one—quite as much so as that of filling of roots. These gentlemen do not tell us whether patients come to them after roots have been filled and state that the teeth are a foot long.

DR. STOREY: I never have had them do so.

DR. CROUSE: If I had so much better success with devitalizing pulps and filling roots than with capping, I would say so. But I do not have that kind of experience. I think a tooth is much more comfortable with a pulp in it than without, and for that reason it should be preserved if possible. I do not like to hear the practice of capping pulps abused or the idea thrown out that it is a failure when I know that it can be made a success. I like to hear the experience of practitioners, but I want them to be accurate and reliable ; and not based on the recollections of patients as to what occurred fourteen or fifteen years ago ; that kind of testimony is not of any value.

DR. STOREY: I would like to say to Dr. Crouse that he lives in Chicago, and I live in Texas. He can save pulps in Chicago that he could not in Texas. I have been fought from one end of the United States to the other on the subject of filling the roots of teeth and upon the subject of destroying the pulps of teeth. I have been fought in my own dental association by men who tell me that they do not destroy any pulps. There is a funeral in my office about three or four times a week. I destroy the pulps always where they are exposed or the tooth is aching, and I don't have the patients come back to me with swollen faces. I do not practice dentistry to make trouble for myself and as long as I capped pulps I did make trouble for myself and for the other fellow too.

DR. CROUSE: You think that the climate has some influence?

DR. STOREY: It is climatic influence.

DR. CRAWFORD: Nothing has been said with reference to the question of differential diagnosis. That certainly cuts a conspicuous figure in the management of the dental pulp. There are two extremes, one represented by my honorable friend from Texas, and the other by my distinguished friend from Chicago. One has gone so far that he says that he devitalizes all absolutely open pulps that come into his office. I would infer from what the other says

that perhaps he represents that class of men who would go so far as to even amputate the pulp, leaving remaining a portion in the root canal and then to cap that. This brings us to appreciate the fact that we should occupy a middle ground. My practice in reference to the management of this question is based upon careful examination of each individual case. I will offer a bonus of any reasonable amount for any man in the south who has ever succeeded in preserving vitality in a deciduous tooth after any considerable portion of its root has been absorbed; and I undertake to say that no man has ever preserved for any great length of time the dental pulp of a permanent tooth that has been exposed to such an extent that the sensibility of the interzonal layer is impaired. My understanding of the effect of nervous reflex action is that where a minor organ or nerve is affected, it very seldom affects an organism of greater magnitude. I never make a protracted effort to save the open pulp of a tooth where it has been exposed long enough to impair the sensibility of the interzonal layer. If I fail to relieve the extraordinary sensibility, and the concomitant symptoms that are present, I proceed to treat it in the manner of my friend from Texas. But on the other hand, if it can be relieved by proper treatment, I would take up the treatment as suggested by my friend from Chicago, and do my best to preserve the pulp. If I do not succeed and the death of the pulp ensues, the tooth is then in the best condition for root filling.

DR. BALDWIN: In the practice of general surgery it is always expected that all allowances possible shall be made for not only climatic conditions but also personal conditions, under which the system may be placed at the time an operation is to be performed. I think in the treatment of the pulp of the tooth the same rule should be observed, and that not only the climatic conditions but the constitutional condition of the patient and the physical and pathological condition in which the tooth may be at the time of the operation should have careful consideration. I believe that these gentlemen who have had the floor, if we were to give a liberal interpretation to what they have said, would not seem so far apart as they would have us believe. I believe oftentimes we may make honest mistakes in our records and in our statement of the condition of affairs. I have seen teeth where it was supposed the pulps had been saved by capping and found the pulp dead; and this is the explanation I have placed upon it: The pulp had died



a painless death, and as is often the case with a dead pulp, without giving any trouble, and it had remained and might remain so for an unlimited time. Some of these teeth that I have seen have been sensitive to heat and cold although the pulp was dead. That may seem a questionable statement, but I think if any of you have experimented with teeth after the roots are filled you have found some of them exceedingly sensitive to heat and cold. That may be easily explained by the changed condition of the current of nourishment to the teeth. We know that the tooth derives its nourishment from two different sources, the pulp and the peridental membrane, and then it is physiologically correct to state, that where the current of nourishment to a tissue is changed and one of the supplies cut off an increased supply goes to it from the other source, rendering those parts hypersensitive. In this way excessive sensitiveness of the cemental or pericemental part of the tooth may occur. We certainly would hope to obtain better results from trying to save a pulp in the case of a robust, healthy young person, than we would in the case of one who is infirm, tuberculous or lacking in all the elements of a healthy physical condition. I do not think it is advisable, from my reading and experience, to attempt to save the pulps of teeth, in the mouths of patients who are not in healthy condition, if the tooth has given any serious trouble, or if there has been severe pain indicating pulpitis.

I think there is much misunderstanding in the discussion of this subject in our dental societies, arising from the different meanings attached to the term "exposed pulp." I have asked its meaning of a great many, and I do not think I ever heard two men give the same definition of an exposed pulp. When I speak of an exposed pulp, I mean one that you can see and get to without taking away tooth tissue. I think Dr. Crouse may have special manipulative ability in handling remedies that he uses, for he certainly has better results than the most of us have. I would judge from Dr. Brown's remark that he has the same manipulative ability, for the remedies he uses, in my hands and in the hands of those I have talked with, on teeth that have had pulpitis for any length of time do not succeed, and in my hands such teeth had better have the pulp destroyed, and the root canals filled.

DR. RHEIN: I wish to point out the advisability of saving the pulps alive in patients who have not reached that age where the teeth have become thoroughly matured. This is a factor that has

been entirely overlooked in the discussion ; and whether such a tooth will eventually retain its pulp or not it will be much more likely to be permanently useful, if the pulp can be retained in a healthy condition until calcification is completed.

DR. CRAWFORD : Do you regard the pulp more liable to be saved before or after the complete development of the tooth in case it should be exposed ?

DR. RHEIN : In my experience I think it is far more difficult to preserve the pulp of a tooth that is not fully developed than it is one that is so.

DR. CONRAD : I deem it eminently proper to attempt the capping of all pulps in young subjects, and to stop these attempts when the patient reaches mature age. In our section of the country, to cap a pulp successfully is a more difficult operation than seems to be the case with our friend from Chicago. I believe with Storey of Texas that the climate has a great deal to do with the success or failure of pulp-capping. In a certain standard publication, a prominent dentist from the East tells us, that to get the best results we must use some such material as oxychloride of zinc to superinduce a deposit of secondary dentine. In the same volume we find a prominent dentist from the West saying, never use an irritant, as irritation will cause pulp calcification, and calcification means the ultimate death of all pulps. What are most ordinary dentists to do, when the dental professors hold to such diametrically opposite views ? From my own clinical experience, it is unsatisfactory practice to use any material or medicament which will have an irritating influence upon the pulp, as even the slightest irritation may cause this process of pulp calcification which is an effort of nature to protect the injured tissue. This process once established, it is only a question of time when the pulp will die. Perhaps the future has in store for us a time of practice, which will cause pulp-capping to be a more successful operation. I hope the day will come when pulps can be capped with a certainty of future comfort—as a live tooth is better than a pulpless one, but a pulpless tooth with the root canals well filled is better than a sick live one.

## SYNTHETIC CARBOLIC ACID.

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BY A. W. HARLAN, M. D., D. D. S., CHICAGO, ILL.

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PHENOLS : ACIDUM CARBOLICUM CRUDUM ; ACIDUM CARBOLICUM ; PHENOL ; PHENIC ACID ; PHENYLIC HYDRATE ; ACIDUM CARBOLICUM SYNTHETICUM. First discovered in 1834 by Runge. It is also contained in the urine of herbivoræ, and is already formed in castoreum. (Richter.)

Carbolic acid has occupied such a large field in the practice of dental surgery for the past twenty-five years, that I thought a short sketch of its leading properties and uses, including synthetic carbolic acid, might not be out of place at this time. One of the earliest authors who wrote on carbolic acid was Garrod, in his *materia medica*, in 1864, as follows: "Carbolic acid. Preparation: A product of the distillation of coal.

*Description:* Carbolic acid is generally met with in the form of an oily liquid, specific gravity 1065, with the odor and taste of creosote. It may also be obtained in crystals, which form long and colorless needles, melting at about 95°. A minute trace of moisture causes the liquefaction of the crystals.

*Properties and composition:* Carbolic acid is sparingly soluble in water, soluble in ether, alcohol and strong acetic acid. It forms crystalline salts with potash, but the solution of carbolic acid does not redden litmus paper. The composition is represented by the formula  $\text{H O}$ ,  $\text{C}_{12} \text{H O}_{55}$ , a hydrate of phenol. It is sometimes called phenic acid.

*Therapeutics:* Carbolic acid possesses powerful antiseptic properties, and has been much used lately to correct the fetor of gangrenous and offensive sores. It renders the discharges less noxious,



and removes their disagreeable and putrid smell ; hence it is particularly useful in cases of necrosis and caries, and other ulcerations attended with offensive discharges. Internally it resembles creosote in its action, and may be given in similar cases. As an *external* application to ulcers, and so forth, one part of the acid to seven or eight of water ; *internally*, one minim in the form of a pill."

*Fowne's Chemistry, 1868 :* Phenol is produced by the dry distillation of coal, and forms the chief constituent of the acid portion of coal-tar oil. This is the source from which it is most frequently obtained. \* \* \* Pure phenol, forms long, colorless, prismatic needles, which melt at 35° C. (95° F.) to an oily liquid boiling at 180° C. (356° F.) and greatly resembles creosote in many particulars, having a very penetrating odor and burning taste, and attacking the skin of the lips. \* \* \* The crystals absorb moisture with avidity and liquefy. It coagulates albumen, and is a powerful antiseptic, preserving meat and other animal substances from decomposition, and even removing the fœtid odor from them after they have begun to putrefy.

*National Dispensatory :* Absolutely pure carbolic acid was obtained in 1871, by Church, from the nearly pure commercial product. \* \* \* Absolutely pure carbolic acid has a faint aromatic odor, it is colorless, crystalline, and does not absorb moisture from the atmosphere (Moss, 1875). Usually, however, it retains a minute quantity of water, by which it becomes deliquescent ; with a little more of water it forms an oily liquid at ordinary temperatures, and if traces of the tar products are present, it acquires a reddish color on exposure. Its odor is modified by the presence of a little cresol.

#### ESTIMATION OF WATER IN PHENOL.

A sample of crude carbolic acid (i. e., the liquid remaining after crystallization of true phenol, and consisting of cresol and higher homologues), when tested by three methods—(No. 1), by distillation ; (No. 2), by agitating 1 volume with 3 volumes of saturated salt solution ; (No. 3), by agitation with equal volumes of 48 to 50 per cent of sulphuric acid (conc.)—gave the following results : No. 1, water, 8.6 per cent ; No. 2, water, 8.00 per cent ; No. 3, water 8.25 per cent.

The distillation process gives the true percentage of water if

the distillate be not observed too late ; next to this is the test with vitriol.—J. A. WILSON, in *Chem. News*, May 16, 1890.

FARQUARSON: *Physiological effects*.—Carbolic acid is, in the first place, an antiseptic, from its power of destroying the minute forms of animal and vegetable life. \* \* \*. It is an irritating substance, and if applied sufficiently long to the skin, will cause sloughing. It has, however, undoubted anæsthetic properties \* \* \*. Although carbolic acid may be of use in correcting fetor it is too irritating to make a good lotion for wounds or ulcers (unless properly diluted with oil 1 to 24, or water 31 to O.j., when it forms an efficient dressing). It has been used as a caustic in some ulcerative affections, as lupus. \* \* \*. If administered in sufficient quantity, it is very poisonous in its operation, causing failure of the heart's action, humid and embarrassed breathing from irritation, and then paralysis of the respiratory center in the medulla oblongata, spinal convulsions, gastro-intestinal irritation, lowered temperature, and albuminuria. Its antiseptic properties sufficiently explain its internal use. Carbolic acid is rapidly absorbed, and quickly and entirely given off by the urine, to which it imparts a peculiar greenish black hue and its own peculiar smell. *Antidotes*: Olive oil and saccharated lime.

One volume of liquefied carbolic acid, containing 5 per cent of water, forms, with one volume of glycerine, a clear mixture, which is not rendered turbid by the addition of three volumes of water (absence of creosote and cresylic acid). (Mitchell.)

*Zinci sulpho-carbolas*: ( $\text{Zn C}_6 \text{H}_4 \text{S O}_4$ ) colorless, odorless crystals, which are readily soluble in water ; external use chiefly. \* \* \*. Turns red under the action of light, with the formation of pheno-chinon (Wichelhaus), an oxidation product.

Impure carbolic acid is of a dark color, and contains several congeneric bodies, especially xylic and cresylic acids. For disinfectant purposes they appear to be at least of equal value with the carbolic acid, and therefore the crude product is very largely used. (Wood.)

As a local anæsthetic it is one of the very best remedies that can be used, relieving pain by its anæsthetic properties, and at the same time lessening suppuration and facilitating cicatrization. (Wood.)

As early as 1870 it was known that carbolic acid was not a powerful germicide. (John Dougall.)

When a liquid containing carbolic acid is boiled with a little solution of mercurous nitrate containing a trace of nitrous acid, a reduction of the mercurous salt takes place and the liquid becomes of an intensely red color. This test will detect one part of carbolic acid in 200,000. (Plugge.) (Biddle.)

The classical work of the late Charles Loudon Bloxam has the most complete account of the composition and properties of carbolic acid extant. He says: "Carbolic or phenic acid, or phenole ( $C_6H_6O$ ), derives its interest chiefly from its constituting a great part of the ordinary commercial creosote (from *kreas*, flesh, and *sozein*, to preserve). It is also present in cow's urine and in that of some other animals.

"It is found chiefly in the heavy or dead oil of coal-tar (page 456), particularly in that portion which distils over between  $300^{\circ}$  and  $400^{\circ}$  F., when the oil is submitted to fractional distillation, and it appears to be the carbolic acid which confers upon this heavy oil its valuable antiseptic properties, leading to its employment for the preservation of wood from decay. In order to extract the acid from that portion of the dead oil which distils between  $300^{\circ}$  and  $400^{\circ}$ , it is treated with caustic soda. A crystalline mass is deposited which is separated from the liquid portion and heated with a little water, when a solution of sodium-carbolate is obtained. This is separated from a quantity of oil which floats above it, and is decomposed with sulphuric acid, when the carbolic acid separates as an oily layer upon the surface. This is drawn off, digested with a little fused calcium chloride to remove the water, and distilled. The distilled liquid, when exposed to a low temperature, solidifies to a mass of long colorless needles, which are easily liquefied by heat. Carbolic acid has the peculiar taste and smell of creosote. It dissolves sparingly in water, but readily in alcohol. When a piece of deal is wetted with a solution of carbolic acid and afterward with hydrochloric acid, it becomes blue on drying. The genuineness of a commercial sample of carbolic acid may be tested by shaking about a drachm of it with half a pint of warm water, which will dissolve the pure acid entirely, but will leave any "dead oil" undissolved.

A solution of one part of caustic soda in 10 parts of water should dissolve 5 parts of pure carbolic acid. When carbolic acid is



shaken with one-fourth of its weight of water, and exposed to a temperature of  $39^{\circ}$  F., it deposits six-sided prismatic crystals of a hydrate,  $2\text{C}_6\text{H}_6\text{O}, \text{H}_2\text{O}$ , which is soluble in water, alcohol, and ether, and fuses at  $61^{\circ}$  F.; the acid properties of carbolic acid are of a very feeble and doubtful character. It is the representative of the class of phenols which resemble the alcohols in composition, but are distinguished from them by their tendency to combine with alkalies. Carbolic acid, or phenole, or phenyle hydrate,  $\text{C}_6\text{H}_5(\text{O H})$ . When distilled with chloride of zinc or of aluminium, phenol yields phenyle ether or diphenyle oxide  $(\text{C}_6\text{H}_5)_2\text{O}$ , and a compound  $\text{O}(\text{C}_6\text{H}_4)_2\text{C H}_2$ . When this is acted on by oxidizing agents, it yields a ketone containing  $\text{O}(\text{C}_6\text{H}_4)_2, \text{C O}$ . On fusing this with potash it yields potassium salicylate  $\text{H O}(\text{C}_6\text{H}_4)\text{C O}_2\text{K}$ , and potassium phenate,  $\text{C}_6\text{H}_5\text{O K}$ . The aqueous solution of phenole gives a purple-blue color with ferric chloride, and a pale yellow precipitate with bromine water (Tribromophenole  $\text{C}_6\text{H}_3\text{Br}_3\text{O}$ ) this is an exceedingly delicate test for phenol.

By the action of zinc chloride on mixtures of alcohols with phenol, the elements of water are abstracted, and phenoles are obtained in which alcohol radicals replace hydrogen; thus phenol and amylic alcohol yield amyphenole,  $\text{C}_6\text{H}_4\text{C}_5\text{H}_{11}\text{O H}$ .

Carbolic acid is very largely used as an antiseptic agent. In medicine it is found very valuable, especially for the treatment of putrid sores; and, in admixture with sulphite of lime, it forms the substance known as MacDougall's disinfectant. Calvert's disinfecting powder consists of clay with 12 or 15 per cent of carbolic acid."

During the past year we have been treated to a surprise in chemistry, by the addition of synthetic carbolic acid, a sample of which I will pass around.

#### SYNTHETIC CARBOLIC ACID.

The "Badische Anilin-und Soda-Fabrik" at Ludwigshafen on the Rhine announces that it has put on the market absolutely pure phenol, or carbolic acid, prepared by synthesis. Hitherto all carbolic acid used in medicine or the arts has been prepared from coal tar. But such an acid is never quite pure, always containing certain impurities derived from the coal-tar. The best proof of the presence of the latter is the melting point. Pure carbolic acid melts at  $41^{\circ}$ – $42^{\circ}$  C. ( $106^{\circ}$ – $107^{\circ}$  F.). The commercial "pure" acid

melts at  $35^{\circ}$ – $37^{\circ}$  C. ( $95^{\circ}$ – $98.6^{\circ}$  F.). and among the very best brands existing in the market none were found melting above  $39.5^{\circ}$  C. ( $103$  F.).

The melting point of the new synthetically prepared acid is, as stated above, at  $41^{\circ}$ – $42^{\circ}$  C. It boils at  $178^{\circ}$  C. ( $352.4^{\circ}$  F.), the exact temperature heretofore found for pure phenol. This temperature rises to  $181^{\circ}$  C. when the whole thermometer is surrounded by the vapors of the boiling acid. The synthetic acid is absolutely anhydrous and colorless, and is soluble in 12 parts of water to an absolutely clear liquid. The most characteristic difference between it and the acid prepared from coal-tar is the odor. All brands of the acid heretofore found in commerce possessed a more or less distinct tarry odor. The synthetic acid, however, has a faint "pure" odor, not in the least recalling that of coal-tar. The odor is almost unperceivable in a 5 per cent aqueous solution, which is not the case with the commercial sorts.

This synthetic acid is put on the market in two forms, in a coherent crystalline mass and in loose crystals.

Gehe & Co., in their October report, state that the precise method by which the acid is prepared has not become known, but that it is probably produced during the process of sulphonizing benzol and subsequent fusion of the benzol-sulphonate with caustic alkali.

The price of this synthetic acid is quite reasonable. It is quoted by Gehe & Co. at 4.60 marks per kilo, while the pure redistilled coal-tar carbolic acid is quoted at 4.10 marks. These figures will at least show the *relative* value of the two products at Dresden.

Some experiments have been made by Dr. Ohlmueller, assistant in the Imperial German Health Department, to test the relative disinfecting power of the "synthetic" carbolic acid (*Pharm. Zeit.*, 1890, 142).

The sample examined, solidified at a moderate temperature to greasy needles that reflected light strongly, had a specific gravity of 1.0681, and melted at  $41^{\circ}$  C. With the exception that the compound gave a faintly acid reaction with blue litmus paper, it corresponded to all the requirements of the Pharmacopœia Germanica. The comparison was made with ordinary official carbolic acid, as well as two varieties of crude carbolic acid—oily and tarry—mixed with sulphuric acid, and the estimate of their relative power as disinfectants and antiseptics was based upon their anti-

bacterial action. The conclusions arrived at were, that there is a difference in the disinfecting power of the two kinds of carbolic acid, since the synthetic acid diminished the life activity of the bacteria experimented upon rather less than the older kind, but that the difference was so small that the two kinds might be considered to be practically of the same value.

The disinfecting action of the mixture of crude carbolic acid and sulphuric acid was found, however, to be greater than that of either of the purer acids used alone.—*Pharm. Journ.*

Pure Phenol, or carbolic acid made synthetically, was exhibited at the recent meeting of the German Apothecaries' Association. It is claimed to be chemically pure and absolutely free from the impurities derived from tar, usually present in ordinary carbolic acid, from which it differs in its melting point, being  $41^{\circ}$  to  $42^{\circ}$  C. against  $35^{\circ}$  to  $37^{\circ}$  C. It boils at  $181^{\circ}$  C., taking the temperature of the vapor. It is anhydrous, a 5 per cent solution of water being clear and almost inodorous. The *Pharmaceutical Journal* (Sept. 28, '89), regards it as of great value in the manufacture of salicylic acid, aside from the advantages derived from its purity as a medicinal agent.—*Western Druggist.*

One of the advantages to be gained in the use of the synthetic product appears to be its greater solubility in water, thus enabling the operator to use it in greater strength without diminishing its causticity.

Carbolic acid has occupied probably one of the most important places in modern surgery,—in fact the Listerian system was founded in great measure upon it. In dental surgery it filled a similar place. It has been used as an obtundent of sensitive dentine, as an ingredient of arsenical paste, as a disinfectant and antiseptic in various forms, as a component of pulp cappings, as a spray for the mouth and throat, to irrigate abscesses, and to open them, as a wash for the antrum, as a direct application to exposed pulps, as a dressing for root canals, as an astringent and stimulant, and as an ingredient for injection around the roots of teeth with camphor, menthol, potash, iodine, glycerine, tannin and various other agents too numerous to mention.

A glance at the Transactions of Societies and the pages of dental books and journals will reveal the fact that of all remedial



agents used by dentists since 1865, carbolic acid and nitrous oxide are the two that have been most written upon. Many scientific men have studied it experimentally and clinically, and they are still engaged in the work which indicates that in spite of laboratory work showing its weak points in bacteriology, dentists have a blind regard for it, and it is their sheet-anchor in so many phases of practice that they are not yet ready to abandon its use. I have had a warm interest in its use in the practice of dentistry, but I must, in spite of its laudation from so many sources, point out the reasons for its abandonment in certain lines of practice.

*First*, Destruction of the pulp. If a paste composed of arsenious acid, carbolic acid and acetate of morphia is used on the pulp, for its destruction, it will be found that the pulp will very soon begin to putrefy if left exposed to the ingress of saliva, even though tolerably well sealed with a sandarac, cotton or other plug. Moisture is always deleterious to the integrity of a pulp destroyed by such a combination. We should use instead oil of cloves, cassia or cinnamon. The action of the arsenic on the life of the pulp is retarded by those agents, but when it is once deprived of vitality its substance is so strongly permeated by the oils that decomposition does not supervene.

*Second*, As a root canal dressing it is, on account of its solubility in water, absolutely unreliable because of its easy disintegration by this agent. In addition to this, as I have frequently pointed out, it coagulates the surface of the animal matrix of the tooth, rendering it necessary to cut away the surface before root filling is attempted, if we desire to preserve the color of the crown of the tooth. It is self-limiting in a hard structure and is not diffusible.

*Third*, It is not a chemical disinfectant, when brought in contact with sulphuretted or phosphoretted hydrogen, only masking the odors instead of destroying them.

*Fourth*, By its positive lack of diffusibility in dentine it prevents the destruction of absorbed ptomaines or septic matter, and gases in the dentine of pulpless teeth, and thereby the object of using it is defeated at the outset. It is positively useless as an agent in the injection of blind abscesses unless we seek to convert such an abscess into one of the acute variety.

*Fifth*, Carbolic acid, as a stimulant around the roots of the teeth by its superficial action, may be discarded from the list of

valuable agents, unless it is first combined with camphor, glycerine, tannin, or an oil to remove its causticity. Water always lessens the causticity of carbolic acid.

*Sixth*, As an application to the pulp when exposed, its office is only transitory. If there be suppuration it arrests it for the moment, but in a few hours it will lose its effect, and in most cases the pulp that we may desire to save will be irretrievably lost. If it be a fresh exposure, the necessity for forming an eschar does not exist, as it in no way simulates nature's covering.

As has been quoted, it is an irritant escharotic and is destructive. That so many pulps do live after its application, under such circumstances, only goes to show how nature may be abused and still preserve her vitality. It were far better to arrest the hemorrhage with an astringent, and place some non-irritating substance over the pulp than to run such risk as its direct application to the pulp.

*Seventh*, As an agent for injection through the roots of teeth to reach an abscess with a fistulous opening, it is valueless if there be fine roots that are not entirely free from fragments of pulp tissue, as it does not preserve pulp tissue even though the root and crown of the tooth be well filled with the best agents to be obtained for this purpose, e.g., gutta-percha, oxy-chloride or oxy-phosphate of zinc. It is a mistaken idea to suppose that an agent like carbolic acid, liquefied or diluted with water, will prove to be a permanent antiseptic in the presence of moisture, such as is nearly always present in a tooth. It does not possess embalming properties, because it is easily absorbed and disappears. It should form no part of a root-filling, nor should it be introduced into roots permanently. Copal, Canada balsam, or other agents of this class, may be used on an exposed pulp in its stead, and for injection into abscesses, using the root of the tooth as a channel, potass-permanganate, silico-fluoride of sodium, boro-glycerine, the oil of cloves, cassia, cinnamon, myrtol, and agents of this class are far more powerful, with better stimulating antiseptic and disinfectant properties, and they do not possess the coagulating property of carbolic acid, or its disagreeable odor, and under no circumstance will they clog a delicate canal or destroy the soft tissue to which they are applied. Carbolic acid should take its legitimate place as a spray, a local anæsthetic and component of mouth-washes in dental practice and as an adjuvant to the oils where local medication

around the roots of teeth may be indicated, or for injection into the antrum of Highmore, combined with glycerine, tannin, camphor or potash, or be relegated to the laboratory as a component of sodium phenate or in other of the chemical uses for which it is so admirably adapted.



PHYSIOLOGY AND ETIOLOGY.

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BY H. A. SMITH, D. D. S., CINCINNATI, O.

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In 1882, at Cincinnati, a resolution was adopted by this association appropriating \$250 for the purpose of beginning the work of recording and tabulating the dental aspects of the various collections of crania. The resolution was on the following day rescinded.

Subsequently several State societies took up the subject and at our last meeting a member of this section representing a committee of the Illinois State Dental Society, suggested to this association the examination of prehistoric crania. It was thereupon moved and adopted "that Section VI. of this association be constituted a committee to act in concert with the Illinois State Dental Society in the matter of the examination and tabulation of prehistoric crania, and that the sum of \$500 be appropriated from the treasury for this purpose."

As the result of consultation among members of the section and of conference with the Illinois society, the conclusion was reached that considerable preparatory work must be done before beginning examinations. With this object in view a scheme has been embodied in the accompanying blank form, which is headed "Cranial Examination Record; Section VI., American Dental Association." An example of the mode of filling in the form with desired data is also supplied, and with printed copies of the blank, laid herewith before the association.

The adoption of a system of dental notation seems to be requisite, and as will be seen, the Hillischer system has been in part employed in the preparation of a scheme and blanks for tabulation of crania. It will be noticed the facial angle has been included with record of race, sex and age. The value of the facial angle

from the dental standpoint is a matter yet to be determined ; as also the question of the manner in which prognathism affects dental expression.

While the scheme presented was being prepared a paper appeared in the *Dental Review*, by Dr. E. G. Betty, of Cincinnati, entitled, "A Critical Examination of the teeth of Several Races, Including One Hundred Mound Builders, Selected from the Army Medical Museum, Washington, D. C." Dr. Betty, unassisted as he was in his work, has shown the true scientific and professional spirit, and the dental profession especially are greatly indebted to him for the careful, systematic, and in some respects original, manner in which he has tabulated so large a number of crania.

We have ventured to propose different bases of measurements from those adopted by Dr. Betty, and call attention first to that of 3 to 3. The character and positions, functions and relation of the cuspidata in both maxilla of the human and also of the comparative subject are of interest to the investigator, and of practical importance to the dentist. It is thought further study of the forms of the dental arches will show that measurement from neck to neck between the palatal centers of the cuspids, or between the like edges of their alveoli when the teeth are missing, will afford a more correct basis for estimating or determining the aspect of the anterior dental arch than would be obtained by measurement from the labial, or disto-labial neck surfaces of the cuspids, or of their alveolar edges.

In crania, from which the teeth have been lost after death, it is often found that portions of the external alveolar plate have been broken away. This is an additional reason in favor of the proposed line of measurements, which include the second molars, 7-to-7- from palatal (or lingual) neck to neck. It is furthermore to be said that the tabulated cranial data is to be finally compared and correlated with measurements of living subjects and of casts and cuts. In these cases the internal aspects are most commonly observed by the dentist, and most accurately represented by casts and cuts. Hence it is concluded that if but one series of measurements is to be made, the internal line would be preferable. It is, however, entirely practicable to adopt both lines, and possibly that may be deemed best.

The measurements from the median alveolar points to the alveolar points between (-7-and-8-) the second and third molars com-

plete the data requisite for a clear representation of the sizes and shapes of the adult dental arches.

The supplemental measurement from the median alveolar point to the spinous process completes the data necessary to a clear grasp of the oral aspect or plan presentation of the superior maxillary; the height of the vault between the second molars being but a single measurement of a concavity, which for a correct graphical expression would require many measurements.

The measurements of the inferior maxillary from the median alveolar point to the distal surface of the condyle, and from the outside to outside of the condyles, together with one definition of the angle of the ramus with the base of the bone, should lead to some instructive conclusions, among which will probably be a closer approximation to the ages of more or less antique subjects.

Distinctively dental details are amply provided for and need not be specifically alluded to further than to direct attention to the desirability of a critical examination of the tubercular, or, as we prefer to term them the cusped characteristics of the molar teeth. Whether certain evolutionary theories may or may not be re-inforced thereby, it is nevertheless of consequence that the attention of the profession should be called to the importance of a careful record of variations in tooth forms for future tabulation and comparison.

Copies of the blank and example records, have been sent to members of the section, and some others, in the endeavor to have the preliminaries of the proposed examination as fully considered as was practicable prior to its presentation to the association.

Since our arrival here, Dr. J. J. R. Patrick, of Illinois, has been invited by the section to take full charge of the tabulation of crania contemplated by the association. The association is to be congratulated upon obtaining the consent of Dr. Patrick to conduct these investigations.

I have pleasure in laying before you a bibliographical résumé of the contributions in all languages to the literature of the subjects of dental physiology and etiology within the past year so far as they could be collected from the files of the *Dental Cosmos*.

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## THE HILLISCHER DENTAL NOTATION, WITH INDICES.

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In the *Dental Cosmos* for April, 1885, attention was editorially directed to the subject of "symbols for the graphical designation of the human teeth in their several positional relations after eruption, providing also for the record of defects in, operations on, substitutes for, or malpositions of individual teeth," with special reference to the Hillischer system, which was particularly described, and illustrative examples given.

The subject received in this country no attention, but in other countries there have been noteworthy endeavors to formulate a scheme, and at the International Dental Congress in Paris last year a system of dental stenography was suggested by Mons. Grosheintz, of Paris, with the hope of its becoming international. The congress nominated Drs. Grosheintz, Dubois, Schwartz, Tralero and Cunningham a commission to consider the subject and report.

In a paper read before the Odontological Society of Great Britain, and published in the *British Journal of Dental Science* of March 15, 1890, Dr. George Cunningham, M. A., L. D. S., D. M. D., reports the proceedings and the mode of notation recommended by the commission, which was unanimously adopted by the congress. In order to bring the subject fully before this association, Dr. Cunningham's paper is subjoined entire, premising that it was also published in the *Ohio Journal of Dental Science* for May, 1890.

### THE INTERNATIONAL DENTAL NOTATION.

At the International Dental Congress held in Paris, September, 1889, Mons. Grosheintz, of Paris, made an interesting communi-

cation entitled "Dental Stenography," and in which he suggested certain symbols which he hoped to see become international, so far as the dental profession was concerned. The main features of the communication may be briefly summarized as follows:

1. He proposed to represent the teeth by the first letter of the Latin words which are ascribed to them; for instance, for the bicuspid he employed "B" for the first and "b" for the second, and the same for the incisors, and so on.

2. Two lines, one horizontal and the other oblique from above or below, would serve to designate by the opening of the angle the right side or left, and by the superior or inferior position of the oblique line to which of the two jaws the tooth belongs.

3. The temporary teeth (*dents caduques*) are designated in the same way, with the addition of "c" as exponent.

4. Then by the aid of the figures 1, 2, 3, 4, placed according to the case after the denominative letter, the degree of caries is indicated.

5. The surfaces attacked by caries are also designated by letters.

6. He also suggests a series of abbreviations to designate the disease, the medicament, and the materials employed in filling.

Mons. Dubois, of Paris, whilst strongly supporting the objects sought to be attained by Mons. Grosheintz, criticised very strongly his symbols, more especially those devoted to the teeth. He then explained the method which he had adopted and recommended in his book, *Aide-memoire du Chirurgien-dentiste*. This method will be explained presently.

Mons. Schwartz, in criticising the symbols suggested, said that he, too, would prefer to see the teeth designated by figures instead of by letters.

I then had an opportunity of explaining the features of a system of notation which has been employed both by others and myself with considerable success for a considerable number of years. As a part of this system I had adopted the method of numbering the teeth employed by Dr. Finley Thompson, who began numbering from the right upper third molar, and counting straight on to the same tooth on the left side, and then continuing from the lower third molar on the left side to the one of the right side, thus finishing opposite where he had commenced. This was done simply to avoid confusion, since his chart of the teeth and the respective numbers attached were already in use in this country.



Candor compelled me to freely admit that this, of all the systems of numbering, was the very worst, and that years of constant daily use of the system had failed to give me the power of at once recalling with certainty the numbers indicative of certain teeth; whereas one was able to memorize the Dubois system by five minutes' study for as many, if not fewer, consecutive days.

Mons. Trallero, of Barcelona, proposed that, since the question was one of great interest, and several different systems had been suggested, a commission be nominated to consider the subject and report thereon. This proposition having been accepted, the commission was duly nominated as follows: MM. Grosheintz, Dubois, Schwartz, Trallero, and myself.

This commission, first of all, decided that it was better to adopt a system of figures rather than one of letters to designate the various teeth. It was found that all the various systems of numbering teeth by figures might be classified into three systems:

- (a) The system of eight.
- (b) The system of sixteen.
- (c) The system of thirty-two.

It was resolved that any system of numbering by thirty-two was inconvenient, confusing, and difficult to memorize; it was therefore unanimously rejected.

The system of eight was warmly advocated. It consists of four groups of eight numerals, starting from the median line, the respective teeth of the upper or lower jaw being indicated by the position of the numerals above or below the horizontal line, and their situation relative to the median line being shown by a vertical line on the median line side of the figures.

The alternative (Hillischer's) system, which substitutes a point or period for the vertical line, was also considered.

The only system of numbering by sixteen which was considered was that proposed by Mons. Dubois, which consists of employing all the *odd* numbers from one to fifteen to consecutively represent the various teeth on the *left* side of the mouth, and the *even* numbers two to sixteen to represent those on the *right*, the lower teeth being distinguished by a line drawn underneath each numeral representing a tooth in the lower jaw.

It was the unanimous opinion that the system of eight numerals was certainly the easiest to comprehend and to memorize. It was considered, however, that while the Dubois system of sixteen was

slightly more difficult, it was yet sufficiently easy of comprehension, and would avoid in an ingenious manner the necessity of employing any point or vertical line before or after the numerals. It was determined, however, to adopt the principle of the horizontal line as indicating whether the teeth belonged to the upper or lower jaw, which only necessitates the use of the line above the numerals in the case of a tooth belonging to the lower jaw, since the simple numeral, without a line below it, is sufficient to indicate its being an upper tooth. It is evident that either of the systems of eight suggested necessitated three signs for each tooth; whereas this system of sixteen only requires one: the number itself for any upper tooth; and two—the number and a dash above—for any lower tooth.

The commission then recommended the adoption of the following system of numbering the permanent teeth:

	RIGHT.									LEFT.								
Upper	16	14	12	10	8	6	4	2		1	3	5	7	9	11	13	15	Upper
Lower	<u>16</u>	<u>14</u>	<u>12</u>	<u>10</u>	<u>8</u>	<u>6</u>	<u>4</u>	<u>2</u>		<u>1</u>	<u>3</u>	<u>5</u>	<u>7</u>	<u>9</u>	<u>11</u>	<u>13</u>	<u>15</u>	Lower

With regard to the temporary teeth, it was decided not to adopt the method of numbering employed in the Hillischer and other systems, which is thus expressed from the median line, 1, 2, 3, 6, 7, but simply to adopt the numbers 1 to 10 on the same principal as the permanent teeth, merely distinguishing the temporary tooth from its permanent successor by prefixing a decimal point in front of the numeral.

It is claimed by Hillischer and others that their system of numbering the temporary teeth avoids confusion by retaining the relative significance of the numerals of the permanent set. This claim is self-evident, so far as the incisors and cuspids are concerned, but not so for the temporary molars, since the gap between the numbers 3 and 6 is decidedly confusing. It was deemed, therefore, simpler and less confusing to utilize the same numbers for the deciduous molars as were employed for their successional teeth, the bicuspid, and not those of their mere namesakes.

The following system of numbering the temporary teeth was adopted:

	RIGHT.							LEFT.						
Upper.....	.10	.8	.6	.4	.2			.1	.3	.5	.7	.9	.....	Upper
Lower.....	<u>.10</u>	<u>.8</u>	<u>.6</u>	<u>.4</u>	<u>.2</u>			<u>.1</u>	<u>.3</u>	<u>.5</u>	<u>.7</u>	<u>.9</u>	.....	Lower

With regard to the symbols to indicate the surfaces of the teeth, it was decided to adopt those employed in the system of notation

which I have published. The only difficulty was with regard to the symbol representing the crown or masticating surfaces. This simply arose from the difficulty in finding an equivalent which would be the same in the various languages. The term "crown," or even the mere term "coronal," it was urged, is not employed in France\* to indicate the masticating surface. It was, therefore, determined to substitute "t" instead of "c" for the crown surface, as being the corresponding mnemonic contraction for triturating surface (F., *Surface triturante*; L., *Superficies triturans*). It was also determined that, since labial and buccal are only two different names descriptive of the same surface, only one symbol, viz, "l" for labial, should be employed; the same remark equally applies to the terms palatal and lingual, and therefore only one symbol, viz, "p," has been adopted. The symbol signifying cervical is a segment of a circle; by accentuating the curve the sign can be made to graphically indicate the extent to which the cervical margin of the tooth is involved.

The following symbols were therefore adopted for describing the surfaces of the teeth:

T., triturating (synonyms: crown, coronal).

M., mesial.

D., distal.

L., labial (synonym: buccal).

P., palatal (synonym: lingual).

∪, cervical.

By means of the first five signs and their obvious combinations, such as mesio-palatal, disto-lingual, and so on, it is easy to sufficiently define even any irregularly-disposed carious cavity; e.g., a cavity extending from the mesial over the crown to the distal surface is sufficiently described by the letters m, t, d. If, instead of a single compound cavity, it is desired to indicate three separate cavities on these several cavities, the use of the colon is sufficient to distinguish the difference; thus, m: t: d:. The colon is always and solely employed to define the localization and the operative terms, and so prevent confusion with any adjacent symbols.

It was further determined not to suggest any further series of

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\* At the time of the commission, had I remembered that Dr. Andrieu had adopted the term "*coronale*" in his *Traite de Dentisterie operative*, p. 353, as applicable to "*la surface triturante des dents postérieures*," I should not have yielded so readily to what seemed a necessary change, since a cardinal factor in the success of any system must be its freedom from any capricious changes.



abbreviations for the present, as it would be advisable to consider the various systems suggested at greater leisure than the present occasion afforded.

It was further recommended that some mnemonic system, such as that recommended by myself, was more likely to lead to satisfactory results than the system of arbitrary signs so commonly used in America.

This mode of notation, recommended by the commission, was unanimously adopted by the congress at its final session.

Despite the fact that this society, in common with other dental societies, has not hitherto devoted much attention to this subject, I think it is unnecessary to dilate upon the very obvious advantages of having some one carefully-considered system of notation accepted for common use. I trust you will agree with me in thinking that it is a matter of congratulation that the co-operate intelligence of the profession has at last been aroused to the urgency of united action in this matter, and thus made a beginning of reducing to uniformity and order the somewhat chaotic productions of the various individual intelligences which have found expression in occasional contributions to various societies and journals, not only in this country, but also in America, France, and Germany. I therefore recommend a trial of this international dental notation as being easy of acquirement, time-saving, and eminently practical. Its ultimate value will depend upon the extent to which it is adopted by the profession. Its value to the individual in keeping a record of his work, in communicating with an assistant, and in corresponding with another practitioner, is evident. But before such a society as this I would urge its value to science, if only from its help in transforming the crude, almost entirely commercial, entries of the day-book or ledger into the carefully-recorded facts of the case-book, the tabulation of which will certainly do much to remove the endless records of vague, unverifiable conclusions with which our scientific literature abounds.

In presenting for consideration a modification of the Hillischer system, time and space will not be taken to make comparisons which can best be made after the suggested system shall have been set forth in detail. It is a sufficient premise to quote the declaration of the commission that—

“It was the unanimous opinion that the system of eight numerals was certainly the easiest to comprehend and memorize.”

The eight numerals are arranged and indicated as follows:

Beginning at the median line, which may be expressed by a vertical mark (but none is necessary), the permanent superior teeth of the *right* side are designated by the numerals 1 to 8 in reverse sequence, separated by half-inch spaces, and accompanied by commas put close to and on the *right* sides of the several figures.

The permanent superior teeth of the *left* side are designated by the same numerals regularly arranged and likewise spaced, but provided with commas put close to the *left* sides of the several figures. These two groups represent, collectively and singularly, the sixteen superior teeth. The sixteen inferior teeth are represented by two identically like groups, furthermore discriminated as belonging to the inferior portion of the system by being put beneath dashes. To specify any permanent tooth it is only necessary, if an upper tooth, to write its numeral and put on its *right* side a comma, or to put its comma on the *left* side, as the case may be, adding a dash to indicate a lower tooth.

The deciduous teeth are represented by the proper numerals, with semicolons instead of commas to indicate the respective sides of the median line. The deciduous molars are represented by the numerals 7 and 8, because they are first and second molars of the deciduous set, and no confusion need arise if the mind be free from the error of classing them with their successors, the bicuspid.

In the following graphical expression of the scheme as thus far described, it is to be noted that the dashes have no relation to the superior teeth, which are clearly and sufficiently designated by the mere numerals; and this is made more obvious by showing first the generic formula for the teeth of the maxilla, each numeral being separated from the other by a hyphen, and each hyphenated numeral representing the four teeth of its class.

Permanent generic formula, thirty-two teeth:

- 1 - 2 - 3 - 4 - 5 - 6 - 7 - 8 -

Then follows the distinctive superior formula wherein the upper teeth of both sides are denoted by mere spaced numerals, sixteen teeth.

Dual permanent superior formula, sixteen teeth:

1 2 3 4 5 6 7 8

The dual permanent inferior formula is expressed by the merely spaced numerals under dashes, sixteen teeth.

Dual permanent inferior formula, sixteen teeth:

$\overline{1}$   $\overline{2}$   $\overline{3}$   $\overline{4}$   $\overline{5}$   $\overline{6}$   $\overline{7}$   $\overline{8}$

The specific permanent superior formula now takes shape by the affixing and the prefixing of the indicating commas.

Permanent superior formula, sixteen teeth:

8, 7, 6, 5, 4, 3, 2, 1, ,1 ,2 ,3 ,4 ,5 ,6 ,7 ,8

Every superior tooth is thus individualized so that it may be identified in character and location whenever its symbol is written or spoken.

Permanent inferior formula, sixteen teeth:

$\overline{8}$ ,  $\overline{7}$ ,  $\overline{6}$ ,  $\overline{5}$ ,  $\overline{4}$ ,  $\overline{3}$ ,  $\overline{2}$ ,  $\overline{1}$ , , $\overline{1}$  , $\overline{2}$  , $\overline{3}$  , $\overline{4}$  , $\overline{5}$  , $\overline{6}$  , $\overline{7}$  , $\overline{8}$

Here the same symbols put under dashes designate the several inferior teeth. For example,  $\overline{5}$  symbolizes the inferior left second bicuspid, and will be read as *dash, comma, five*. ,5 symbolizes the superior left second bicuspid, and will be read as *comma, five*.

The several formulas for the deciduous teeth are expressed as follows:

Generic deciduous formula, twenty teeth:

0 1 0 2 0 3 0 6 0 7 0

Dual deciduous superior formula, ten teeth:

: 1 : 2 : 3 : 6 : 7 :

Dual deciduous inferior formula, ten teeth:

:  $\overline{1}$  :  $\overline{2}$  :  $\overline{3}$  :  $\overline{6}$  :  $\overline{7}$  :

Deciduous superior formula, ten teeth:

7; 6; 3; 2; 1; ,1 ;2 ;3 ;6 ;7

Deciduous inferior formula, ten teeth:

$\overline{7}$ ;  $\overline{6}$ ;  $\overline{3}$ ;  $\overline{2}$ ;  $\overline{1}$ ; , $\overline{1}$  ; $\overline{2}$  ; $\overline{3}$  ; $\overline{6}$  ; $\overline{7}$

These formulas provide for every form of expression necessary for the specific description of the human deciduous and permanent teeth in whatever distinctively normal relation and grammatical situation it may be requisite to write or speak of all or each of them *in situ*.

If it shall seem that the scheme is too elaborate or complex for ordinary and facile comprehension, the seeming difficulties will disappear under careful scrutiny, with such brief consideration as may suffice for a complete grasp of the foundation principles of the really simple symbols. A short period of practice will verify that



conclusion and dispel all doubt of the precision and immediate adaptability of the Hillischer notation.

It remains to provide suitable abbreviations for the supplemental description and indication of dental abnormalities, their correction, substitution, or repair. This undertaking is a difficult one from any point of view, and the subjoined scheme is submitted with a full knowledge of its imperfections and incompleteness, but the hope that it may stimulate efforts which will result in a practicable scheme is the sustaining incentive to its presentation. The notation with a modified series of abbreviations has been tentatively employed for recording the first series of pre-historic cranial observations and measurements specially undertaken by Section VI, and that work, when thus completed, will probably serve to practically prove the applicability of the system to the recording of scientific dental investigations and their tabulation for further study. That series of abbreviations is here supplied with interspersed supplemental abbreviations to furnish collectively a series that will in great part meet the requirements of the practitioner, as well as the investigator.

A : Artificial.	M : Amalgam.	v : Vacancy.
a : Abscess.	m : Mesial.	W : Wired.
B : Bridge.	mg : Missing.	w : Worn.
b : Buccal.	N : Necrosed.	X : Exostosed.
C : Crown.	n : Neck:	x : Extracted.
c : Coronal.	O : Oxychloride.	Z : Zylonite.
D : Denture.	o : Opening.	z : Zinc Phosphate.
d : Distal.	P : Pivoted.	○ : Normal size.
E : Erupting.	p : Palatal.	⊖ : Wide and short.
e : Eroded.	pu : Pulpless.	◊ : Narrow and long.
F : Filled.	py : Pyorrhea.	l : Cusped.
f : Fissure.	R : Replanted.	+ : Bicusped.
G : Gold.	r : Root.	Δ : Tricusped.
ga : Gutta-percha.	S : Scorbutic.	□ : Quadricusped.
I : Implanted.	s : Supernumerary.	△ : Quinquecusped.
i : Irregular.	sy : Syphilitic.	' : Small.
L : Lost.	T : Toothless.	" : Large.
l : Labial.	t : Tartar.	''' : Very large.
ll : Lingual.	V : Vulcanite.	

} Cavity,  
degree,  
or size.

Capital letters have been chosen as indicative abbreviations for

words less frequently used than those represented by lower-case letters, and care has been taken that grouped abbreviations shall not in practice prove confusing by use as letters which may have differing significations when associated than when used singly.

Caries is present whenever a suitable positional index is used without a qualifying index or indices, and when the symbol of a single tooth is employed the indices may follow the symbol, as 7, d:c:m, which signifies that the superior right second molar has carious cavities in its distal, coronal, and mesial surfaces; but if these cavities were confluent, the colons would be omitted and the expression be 7, d c m. If in an inferior left second molar the distal and coronal cavities were confluent, and the mesial cavity was separate but extended into the tooth-neck, the expression would be  $\bar{7}$  nm:cd.

When an entire case is to be graphically stated so that the situation may be taken in at a glance, the indices are best placed over the superior and under the inferior symbols:

cf.	d.	c:m.	c	nl.	m.	m.	nl.	m:c.	m.	c.					
<u>8</u>	<u>7</u>	<u>6</u>	<u>5</u>	<u>4</u>	<u>3</u>	<u>2</u>	<u>1</u>	<u>,1</u>	<u>,2</u>	<u>,3</u>	<u>,4</u>	<u>,5</u>	<u>,6</u>	<u>,7</u>	<u>,8</u>
8,	7,	6,	5,	4,	3,	2,	1,	,1	,2	,3	,4	,5	,6	,7	8,
cf.	mg.	cd.	c.	m.								c:d.	mg.	cf.	

In this case the superior right third molar has a coronal fissure cavity; the second molar, a distal cavity; the first molar, a coronal and a mesial cavity; the second bicuspid, normal; the first bicuspid, a coronal cavity; the cuspid, a cervico-labial cavity; the lateral, normal; the central, a mesial cavity; the left central, a mesial cavity; the lateral is normal, the cuspid has a cervico-labial cavity, the first and second bicuspids are normal, the first molar has a mesial and a coronal cavity, the second molar, a mesial cavity and the third molar a coronal cavity.

The inferior right third molar has a corono-fissure cavity, the second molar is missing, the first molar has a corono-distal cavity, the second bicuspid is normal, the first bicuspid has a coronal cavity, the cuspid a mesial cavity; the lateral, central, left central, lateral, cuspid, first and second bicuspids, are normal, the first molar has a coronal and a distal cavity, the second molar is missing, and the third molar has a coronal fissure cavity.

This example shows how much descriptive matter may be condensed into five lines of symbols with their indices.

The following example will illustrate some of the practical applications of the symbols in each of their several groups, associated with exponents from the series of indices:

-1- The four permanent incisors.

-6- The four permanent first molars; and it is mnemonically helpful to note the coincidence that these are the molars of the sixth year.

-8- The four permanent third molars.

$\frac{3}{4}$  The two superior permanent cuspids.

$\frac{4}{4}$  The two inferior permanent first bicuspid.

$^{\circ}6^{\circ}$  The four deciduous first molars.

:7: The two superior deciduous second molars.

:2: The two inferior deciduous laterals.

d: c: FG

6, The superior permanent right first molar, distal and coronal cavities filled with gold.

dcm: FM

, $\frac{7}{7}$  The inferior permanent left second molar, confluent distal coronal mesial cavity filled with amalgam.

mpu: alo

,1 The superior permanent left central, mesial cavity, pulpless, abscess, labial opening.

I

4, The superior permanent right first bicuspid implanted.

ACP

,3 The superior permanent left cuspid, artificial crown pivoted.

L E

6; 4, The deciduous superior right first molar lost, and the permanent first bicuspid erupting.

mFga

,4 The permanent inferior left first bicuspid, mesial cavity filled with gutta-percha.

cFga

; 6 The deciduous superior left first molar, coronal cavity filled with gutta-percha.



fFG

,5 The permanent superior left second bicuspid, fissure-cavity filled with gold.

A A A A A A A A A CGz. Pz. Pz. CG. CGz.

6, 5, 4, 2, 1, 1, 2, 5, 6 BDG. 7, 3, 3, 4, 7 The artificial superior right first molar, second and first bicuspids, lateral, central, left central, lateral, second bicuspid, and first molar bridge denture of gold fixed on the right second molar gold-crowned, the cuspid pivoted, the left cuspid pivoted, and the second molar gold-crowned ; all secured by means of oxyphosphate cement.

The desire to limit the list of indices to the least well-working number prevented the early introduction of precisely definitive signs, but it was finally found that the common marks ', " and ""', would quite clearly indicate either the presence and relative sizes of cavities, the relative sizes of sound teeth, and parts of teeth or the degrees of their departures from normal characters, conditions, or their aberrations. Other signs have been added to express the fact of variation from or accordance with the typical form in cusped teeth. A few illustrations are subjoined.

Δ' □ □''

c'. d':cf'. d'':c'':m'. CLr. O.v'. ". s'0'p. ○. ''':f'np.

8, 7, 6, 5, 4, 3, 2, 2, 1,

We have here described the permanent superior right third molar of small size, tricusped in character, and having a small coronal cavity ; the quadricusped normal-sized second molar, small distal cavity, and small coronal fissure cavity ; the first molar large quadricusped, large distal cavity, large coronal cavity, and small mesial cavity ; the second bicuspid has lost its crown, and only its root remains ; the first bicuspid is normal, a small vacancy existing between it and the large but duly proportioned cuspid ; or supernumerary lateral of long, narrow cusped form, occupies a palatal position between the cuspid and the wide and short lateral ; the large and bicusped central has a small fissure cavity in the palatal part of its neck. This case is, of course, conjectured for merely illustrative purposes.

The ten deciduous superior teeth, with the sixth-year molars present, would be expressed as follows :

6, 7; 6; 3; 2; 1; ;1 ;2 ;3 ;6 ;7 ,6

The same denture would be represented as subjoined by the Dubois-Cunningham system :

12 .10 .8 .6 .4 .2 .1 .3 .5 .7 .9 11

A careful comparison and alternative trials of the two systems will enable one to decide for himself their relative readiness and efficiency in use.

Nothing short of repeated and general demonstrations by investigators and practitioners can fairly determine the actual feasibility of the Hillischer, or any other system of dental notation, with its appropriate indicating letters or signs.

## IMPLANTATION.

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BY LOUIS OTTOFY, D. D. S., CHICAGO, ILL.

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Last year this section presented a report and records of cases of implantation. The extent and value of this operation, and the position which it should occupy in dental practice, can be decided only after careful observation of the cases for a sufficient number of years.

One of the gentlemen who made a report last year\* presents this year an additional report on observations made during the year. By the loss of several of the earlier cases reported on, last year, the percentage of successful cases is reduced from 73 to 60. Some cases retain all the appearances of perfect health for a long time, and then suddenly loosen and drop out, within a week or ten days; absorption of the root (and of the root filling) being invariably the condition presented.

The earliest cases have failed after three years and five months of a kind of service to which no character of artificial substitute can even be compared. Whether that length of time is sufficient to justify the operation must be determined by the patient and the operator. In connection with dropping out of these teeth in one case, the following condition was noticed: A tooth which had been in perfect condition for three years and five months, suddenly became loose and dropped out, the root being apparently absorbed in the usual manner. Within two weeks after the loss of the tooth an impression was taken for the purpose of making an artificial substitute, the latter was constructed in such a manner that the plain tooth impinged on the gum until it made the cup-shaped depression which gives a natural appearance to these teeth. The plate however would not entirely fit in its place, and an examination

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\*Dr. Louis Ottofy, of Chicago.



revealed the fact that the artificial tooth, after making the cup-shaped depression in the gum, came in contact with the root of the implanted tooth, which was supposed to have been entirely absorbed. The gutta-percha filling in the root-canal was also visible. In this case the absorption commenced at the neck of the tooth and cut the crown off, leaving the root in the bone.

It may also be added that inflammation of the gingivæ or of the periosteum of the bones or teeth in the vicinity of implanted teeth is almost certainly fatal to their existence.

Dr. M. H. Fletcher, of Cincinnati, has made certain observations on the subject of implantation. His views may be briefly summarized:

He implanted in the external part of the maxilla of a goat seven teeth, and in the hind legs two teeth, making in all nine teeth, performing the operations at different times. One year after the first and four months after the last operation the goat was killed, and the bones containing the implanted teeth were prepared for the microscope. Those who are interested in this subject can see the photomicrographs of these specimens. Some of the teeth disappeared completely, only the gutta-percha remaining; others seem to have been completely decalcified. In some the cementum seems to have become organized and some were thoroughly ankylosed to the adjacent bone, while in some the cementum seems to have progressed in growth at the expense of the dentine. He does not believe the presence of cementum to be essential to success, but on the contrary thinks it detrimental.

He further concludes that the resorption and rebuilding of the various tissues of the body necessitate the absorption of the roots of implanted teeth and thereby their loss. As a temporary replacement of lost teeth the operation of implantation is justifiable to those who comprehend it.

#### DISCUSSION.

DR. PATRICK: What I have to communicate is simply supplementary to the chairman's report; you can form but little idea of the extent and importance of the proposed examination that has been so long delayed, until some of the work is actually done.

We desire the co-operation of as many as possible in the prosecution of this investigation. It is not a subject in which one man

can reap all the honors that may be connected with it, for it is a subject eminently fitted for investigation by the many. I have been engaged in the investigation of this subject for twenty years and have accomplished very little owing to the character of the work, and I therefore wish to impress upon your minds that what would take twenty years for one man to accomplish can be done in one year by twenty men, when done systematically. (Dr. Patrick read his report and tables).

Now, gentlemen, if we earnestly prosecute this examination of prehistoric crania that are already collected and properly cared for in the archæological museums of our country, our profession will have an opportunity for the first time in its history of returning something to the surgeon and physiologist for what they have done for the dental profession; then is it not the duty of every man who prides himself in his profession to lend a helping hand in this investigation?

For many reasons it would be improper for one person to travel over the country visiting the public and private collections of prehistoric crania with the view of collecting facts (not verified) that are to serve as guides for the many. If I go where there is a collection of human crania I shall solicit every reputable dentist in the vicinity to assist in the examination, then we will have a cloud of witnesses to the truths brought forth in the examination; and we will find when these tables are collected and digested that they will either prove or disprove a great many theories.

The results of this investigation may clip the wings of some who love to fly and soar above the earth, but that we cannot help, for they must be content to walk upon *terra firma* where they properly belong.

DR. OTTOFY: It was the intention of the section to secure a report from those who had implanted teeth, and to continue to make annual reports to this association on that subject. Last year Dr. Smith secured quite an extended report. If this could be kept up from year to year we should eventually know the value of the operation of implantation. Unfortunately I have received reports from but two men. I, myself, have to report additional failures to those reported last year, bringing down the percentage of success to 60, when last year it was 73. The oldest case on which I can report remained in the mouth three years and five months. I do not know of any one who claims cases standing a longer period

than that, except Dr. Younger. In all of them the only cause that could be assigned for failure was absorption. In one case which remained in three years and five months the tooth was in a perfectly healthy condition from the time it was implanted until June of this year. The tooth then immediately became loose, and in less than a week had dropped out. An artificial substitute was made for the patient, using a plain tooth, making it so long that it would impinge into the gum, with the intention of making a cup-shaped depression. After the patient had worn the plate three or four days it would not go into its position, and she came to see about it, and then I discovered that the entire root, including the gutta-percha, of the implanted tooth was still there. The absorption of the root evidently had commenced at the neck, virtually cutting the tooth off, leaving the root of the implanted tooth in the socket. Dr. Fletcher has made some interesting experiments in connection with this subject which were presented at the International Medical Congress in Berlin. He has implanted nine teeth in the extreme lower portion of the maxilla of a goat, and two of them into its hind leg, implanting the teeth and then drawing the skin over them so as to have them perfectly enclosed. He has examined them at various intervals.

The oldest one at the time of the examination was a little over a year old, and the last one four months old. He describes very carefully the condition of these teeth when the goat had been killed, and sections made of them, and we have here photo-micrographs of the plates made from the sections. In all of them absorption had taken place, in some to the extent that nothing but the gutta-percha had remained. His idea, based upon his observation, is as follows: He believes that the building up and the destruction of tissue goes on at all times; that this extends to the implanted tooth, but that the difference between the living tissue and the dead implanted root is, that the living tissue replaces itself, while the dead tooth is not able to do it; that therefore, when absorption of it takes place the root is simply gone and nothing remains to hold it in position.

DR. A. H. THOMPSON: With regard to the question of notation, it has been apparent for some time that we ought to have some uniform system, and it is not material what system is adopted so that it becomes uniform. I would like to see some steps taken toward having the association adopt a system as official, and as recognized throughout the United States, which shall enable us to



communicate to each other in our investigations. It is probable, however, that the time is not yet ripe for a movement toward uniformity by the appointment of a committee to prepare a scheme. But if the workers in this matter will continue their labors they can in a few years furnish us a system that will answer all purposes. Such a system must be arbitrary as there is no natural system on which to base it.

DR. H. A. SMITH: I think, as Dr. Thompson remarks, a system should be adopted, but it should be more far-reaching. France and Germany and other foreign countries, are at work upon a system of notation which they can uniformly adopt. If we, in correspondence with them, could adopt the same system it would be very easy to communicate with each other upon subjects relating to dental science. It may be too soon to appoint a committee, and yet the paper just read I think will call attention to the need of some uniformity in that direction.

DR. P. T. SMITH: I have a method that seems to me a very clear and useful one. It consists of perpendicular and right angle lines which indicate all the teeth with some variation, indicating also the surface affected by and the character of the disease, the material with which the teeth are filled, and various operations that are performed upon the dental organs.

(The doctor illustrated his system of notation by diagrams upon the board).

DR. OTTOFY: I desire to say a few words in regard to the paper of Dr. Patrick and in regard to the work of the section by which it was presented. Dr. Patrick has prepared simple, plain and easily comprehended tables and blanks, and the section has made arrangements so that those tables and blanks will be printed and given to those who are prepared to undertake the investigations. It would be well for those gentlemen living in cities where there are collections, to either notify Dr. Patrick or the chairman of the section whether they are willing to examine them, and it will be well before the blanks are ready to be distributed to ascertain the number of crania that will be available for examination, because it is the intention of the section to go on rapidly with this work, and to present a report of the number examined at the next meeting. It will only include at this time the prehistoric crania. There are in all probability collections of crania in small cities, owned by private persons, which could be examined and tabulated.

DR. NOBLE : I recognize the very great value of the labor of Dr. Patrick in this direction, and we shall be able, if all will take hold of this work in the proper spirit, to have such a report as we have never had before. In the city of Washington we have collections that will require a great deal of time for examination. I have been talking with Dr. Patrick and I am willing to take hold of this work in my city, and I think I can get the labors of some of my boys to assist me in going very carefully through the museums and collections in Washington.

ANATOMY, PATHOLOGY, AND SURGERY.

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BY M. L. RHEIN, M. D., D. D. S., NEW YORK, N. Y.

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This section on Anatomy, Pathology and Surgery has not been long enough one of the working parts of this association to warrant saying whether it has been successful or not. Up to the present time it has not received the support and encouragement it is entitled to. Our section makes an appeal for more scientific research. It is not creditable to the American Dental Association that students of to-day have no better means of studying oral anatomy than was obtainable twenty years ago. The demand is imperative for a text book giving in detail the gross anatomy of each tooth and its relation to all surrounding tissues; and it would be very fitting if such a work were instituted under the auspices of this section.

Why is it that so many of the profession hesitate to take charge of cases of oral surgery? The answer is simple. They are afraid, because they recognize the fact that their knowledge of the anatomy of the oral cavity is defective.

The colleges recognize the importance of this work by giving clinics in oral surgery. They have long since determined that watching the operations of the professors on operative dentistry is not sufficient to make good operators; consequently the importance placed on the infirmary work accomplished by the students.

The colleges must follow the same line of reasoning in teaching oral surgery. This can only be accomplished by having the students perform these operations themselves under the direction of anatomical demonstrators.

In conclusion we beg to report for consideration by the associa-



tion a paper by your secretary, M. L. Rhein, on "Amputation of roots as a radical cure in chronic alveolar abscess: (in pyorrhœa alveolaris complicated by alveolar abscess.)"

Also a paper recommended to our section by the committee on voluntary essays, "On the occasional origin of true chronic alveolar abscess from teeth with living pulps," by Arthur C. Hugenschmidt, of Paris, France.

## THE OCCASIONAL ORIGIN OF TRUE ALVEOLAR ABSCESS FROM TEETH WITH LIVING PULPS.

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BY ARTHUR C. HUGENSCHMIDT, M. D., D. D. S. PARIS, FRANCE.

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It is generally admitted as a fact throughout dental literature that a *true chronic* alveolar abscess is *always* due to the products originating from the decomposition of a *completely devitalized* tooth pulp, which products set up an inflammatory process in the region of the apical foramen and then finally find their way to the surface in one or more directions.

The object of this short paper is to indicate that a dead pulp is not at all a necessity to bring on a true alveolar abscess and that a tooth with a living pulp, a pulp which has retained all its normal physiological functions, such as sensation to extremes of temperature, heat and cold, sensibility of the overlying dentine, etc., can be the source of a chronic suppurating inflammation, which in its consequences and clinical aspect is absolutely similar to an abscess due to a completely devitalized tooth. Such cases are rare but they do exist. I shall give the three following histories:

The first observation I made was in 1883. The tooth, a first right upper molar, had felt uncomfortable to the patient for some time. I found on examination the existence of a well developed typical alveolar abscess, immediately opposite the anterior buccal root of the molar, from which a small quantity of pus was continuously discharging. Although the tooth had never been filled, I found it somewhat dark in appearance and more sensitive on percussion than any neighboring teeth. I came to the conclusion that I had to deal with a dead tooth and decided to trephine it. But, as soon as I had passed through the enamel, the patient complained of that particularly severe pain often encoun-

tered at the junction of the enamel and dentine. I tried to go deeper but the pain becoming more marked I felt sure I had made a mistake, so I closed the tooth temporarily with gutta-percha. At the next sitting I made an exploratory trephining in both the neighboring teeth; but here again I fell upon sensitive parts. I then concluded that I probably had to deal with a suppurating periosteal inflammation of external origin, traumatic or otherwise. I therefore enlarged the fistulous tract and then scraped the part of bone I came in contact with, which was in a necrosed condition. The abscess closed for a short time but soon reopened again, and when the patient returned, he directly pointed to the first molar as having been somewhat annoying a few days before. I hesitated no more; after having taken out the gutta-percha filling, I drilled as deep into the tooth as possible and applied an arsenical paste. The next day the pulp cavity was opened and the pulp was still sensitive and especially so in the anterior buccal root: profuse bleeding attended the removal of the pulp filaments from their respective roots; from the anterior root the pulp was easily removed, the root and foramen being unusually large. On removing the pulp from this last root I found it mixed with pus, and about its middle portion it looked to me as if some pathological process had been going on. The roots were treated antiseptically and the abscess disappeared and never returned, the tooth being in position to-day.

The second case, I now mention, dates back two years—in one way it does not properly belong to the class of cases we have in view, still it may be interesting to mention it.

The abscess was situated opposite an upper second molar tooth of the left side, on a level with the end of the roots, at an equal distance between the anterior and posterior buccal roots. The tooth had a very large anterior proximal cavity extending into the pulp chamber. The palatal and anterior buccal roots were completely devitalized, while the posterior buccal branch of the pulp was highly sensitive. Both the first named roots were antiseptically treated, so as to render them completely aseptic, while the posterior buccal root with its living nerve was left untouched. No change in the abscess occurred; it continued to discharge; every morning a gum boil presented. Finally I devitalized this posterior root, and on removing the pulp, I produced a very severe pain. Pus was found to surround the upper portions of the pulp. The



apical foramen was also very large. The roots were carefully filled a few days afterward, and the abscess disappeared.

The third case is the most interesting one. The patient, a young lady of 17 years, had had her right central incisor filled with gold some five years before. Two years ago I saw her for the first time, for an alveolar abscess arising from a devitalized second bicuspid; all the other teeth looked perfectly well.

A year ago, in July, 1889, the patient came to me complaining of some uneasy feeling about her right central incisor. On examination I felt opposite the end of the root of that tooth a slight projection, which gave me the sensation of a blind alveolar abscess. Although this tooth already looked to me somewhat darker than its neighbor, I treated it with counter-irritants, aconite and iodine. A few applications took away the uneasy feeling, and the patient was discharged, although that well-marked projection still existed. The tooth kept quiet for some time, and in February, 1890, when I saw the patient for other operations, I found the projection more prominent; it was the size and shape of a small pea, still nothing was done to it at the time. In April last the patient returned, stating that the abscess had burst a few days before. Physical appearance of the parts unmistakably indicated alveolar abscess, plus the dark appearance of the tooth, so I decided to trephine it.

I found sensitive dentine as soon as I had passed the enamel, moreover the tooth was sensitive to hot or cold water. I drilled as much as I could and then applied an arsenical paste, discharging the patient till the next day. When she returned, sensation was still very marked, so I gave her an injection of cocaine which enabled me to reach the pulp cavity; as soon as I withdrew the drill a drop of pus, soon followed by blood, came out. Notwithstanding the injection of cocaine, when I tried to extirpate the pulp I found it highly sensitive, and it was only after having made an injection directly into the pulp canal and waited a few minutes, that I was able to remove the pulp altogether; in this case again the apical foramen was unusually large. At the end of a week all trace of abscess had disappeared and two weeks after the extirpation of the pulp the tooth was filled and has given no trouble since.

The facts which have just been enumerated tend to show that a true alveolar abscess can occur from a living tooth.

The primary cause or origin of such an abscess will always reside in the pulp; it will be a local circumscribed pulpitis in any

region of the substance of that organ, and as I have remarked, the apical foramen being so unusually large, the products of inflammation pass out easily into the surrounding tissues, making their final exit on the surface of the gums, without causing great systemic or local disturbances.

In the last case mentioned the primary origin of the trouble was probably a local pulpitis due to a small gold filling, inserted when the young lady was only twelve years old: the patient being of a well marked lymphatic temperament, the calcification of the roots being not completed, an arrest of development occurred, which accounts for this extremely large foramen.

In the two other cases which were observed in persons over 30, another explanation might be given; the primary irritation of the pulp from whatever cause, always results in hyperæmia of the organ, which if long-continued produces an hypertrophic condition of the pulp, resulting later in absorption of the inner part of the root, causing an enlargement of the pulp cavity, a pathological condition which has been clearly defined by our distinguished confrère, Dr. G. V. Black.

For an alveolar abscess to be present in a living tooth, it is absolutely necessary, I think, that this enlarged condition of the foramen at the end of the tooth be present. Otherwise, should the foramen be normal, any local pulpitis would rapidly produce a congestion of the pulp and its rapid strangulation at the apical foramen. Only one other condition would prevent this death of the pulp by compression, and that is where the pulp was exposed in the crown of the tooth. In that case the inflammatory products could escape by this external opening. It will be noticed that hardly any pain was experienced in any of these cases, which is again explained by the enlarged condition of the foramen, which allows no compression of the pulp.

In a diagnostic point of view the only signs we possess are: First, the presence of an alveolar abscess immediately opposite the end of the root of a tooth. Secondly, a slight change in the color of the tooth—a darker hue. Thirdly, the patient indicates that tooth, and that tooth only, as having been the seat of slight annoyances but no pain.

These three signs being present, one need not hesitate to trephine the suspected tooth, even if the tooth is sensitive.

Finally the conclusions arrived at are:

1. That a true chronic alveolar abscess does not always arise from a completely devitalized tooth.
2. That a living tooth can be the source and only origin of a true alveolar abscess.
3. That an alveolar abscess in a *living* tooth can only occur if the apical foramen is abnormally large.



## AMPUTATION OF ROOTS.

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BY M. L. RHEIN, M. D., D. D. S., NEW YORK, N. Y.

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The removal of a portion or the whole of the root of a tooth has long been advocated by a few men of our profession, as a means of restoration to health of that class of teeth which do not yield to milder remedial treatment.

Like many other operations in oral surgery which naturally come within our sphere of practice, it seems to have received little or no attention from those who have made our literature; and text books are singularly silent concerning this important method of procedure.

In the majority of cases the operation is one presenting little difficulty. There are no dangerous anatomical points to be avoided except when working under the Antrum of Highmore or in the region of the mental foramen.

The instruments required are a sharp spear-shaped drill with which a hole is drilled through the process, passing through the root on a line with the canal. This is followed by a new fissure bur which worked laterally in both directions readily severs the end of the root.

Usually no anæsthetic is required. We must, however, occasionally resort to one where the operation is of considerable length and very painful. Under such circumstances a physician should be summoned who will administer an anæsthetic, leaving the dentist undisturbed in his surgical interference.

## CHRONIC ALVEOLAR ABSCESS.

It is well known that the longer an alveolar abscess exists the greater the damage to the surrounding tissue. The injury that the

general system receives from the absorption of a certain amount of pus must not be ignored.

About the apices of the root is found an ever-enlarging zone of diseased tissue. This can well be called the apical space, and acts as a hot-bed for the formation of pus, ichorous or not, as the case may be. The continued effect of this is to denude the apex of all circulatory supply, and in time to bring about a necrotic condition of the root which gradually extends toward the crown of the tooth until eventually the entire root becomes necrosed. Treatment through the canal of the root for the cure of this disease is useless after necrosis has once attacked the apex. The operation of entering through the gum and burring the diseased tissue is uncertain in its results. Having filled the root or roots, the diseased portion is excised. This is at once followed by the vigorous use of the bur in the surrounding pathological tissue, and an immediate and radical cure is the result. All that is requisite is to see that the operation has been performed under true aseptic conditions, and that the parts are kept so until the wound has entirely healed.

CASE I. Mr. H., æt. about 30, presented in 1882 to have his mouth put in good order. A very long and firmly-embedded root was all that remained of the right superior cuspid. As far as could be ascertained the crown had been broken off for some years, and at intervals the root had given rise to considerable pain. There was no evidence of any abscess. Having thoroughly cleansed the canal, the apex was found to be open, and the root slightly absorbed around the edges. A 40 per cent solution of chloride of zinc was pumped through the apex, which was then sealed with chloro-percha one-third of the length of the root, and the remaining portion was filled with oxyphosphate of zinc.

Ten days later the patient returned, suffering severely from all the symptoms of alveolar abscess, except the swelling. The external parts appeared about normal, and it seemed impossible to bring about resolution. The temperature of the patient was now above 100° F., and a diagnosis was made of blind abscess, with slight septicæmia. The patient was at once put on tonic and antipyretic treatment, and it was determined to amputate the end of the root.

Chloroform having been administered, an incision was made in the gum over the apex of the root and a piece of tissue about three-eighths of an inch square was removed. A spear-shaped drill was then passed through the process and with a new fissure-bur one-

eighth of an inch of the apex was severed from the rest of the root. It was with great difficulty that this was removed, and not until a considerable portion of the alveolus had been drilled away. Attached to the root was a sac about half an inch long. The entire space was then thoroughly burred. It was washed out with a carbolized solution and allowed to heal under iodoform dressing. Had we our present knowledge of the various germicides, carbolic acid would have been discarded for something more efficacious. A crown was subsequently attached to the root and is doing good service to-day.

CASE II. Miss S—, aet. about 18, came in 1887 to have an alveolar abscess treated. A year previous she had the right superior first bicuspid filled by another dentist. Arsenic had been used to devitalize the pulp, and the roots and the crown were then filled. An alveolar abscess, having a fistulous opening on the buccal side, made its appearance within a few weeks and had been under treatment at least six months when I first saw her. The old fillings extending to the apices of the roots were removed and then renewed in order to be certain that the roots were properly filled.

The opening in the gum was then enlarged with a tent of cotton saturated with aromatic sulphuric acid; this was allowed to remain in position about four hours. On the return of the patient m. xx of a four per cent solution of cocaine hydrochlorate was injected into the gum on both the palatal and buccal sides. A small section of gum near the end of the root was then removed from the palatal side. By means of a spear-shaped drill, followed by a fissure bur, the end of the palatal root was amputated through the space made on the palatal side, and the buccal root was similarly operated upon through the opening on the buccal side. The two fragments were easily removed. The entire apical space was thoroughly drilled and sprayed with a solution of bichloride of mercury in hydrogen peroxide. Two iodoform tents were placed in position, one in each opening; they were reduced in size each day until the wound had entirely healed.

CASE III. Miss A—, aet. about 20, presented herself in 1888 to consult about the superior right cuspid. The tooth was pulpless, had a large posterior approximate filling which had been inserted four years previously in Vienna. An alveolar abscess had made its appearance soon after. Her dentist had drilled a small opening leading to the pulp canal above the neck of the tooth, in order to



give vent to the mephitic gases. The abscess had certainly become chronic, as a fistula on the labial side some distance below the apex of the root was constantly discharging pus.

After removing the filling the canal was found filled with the remains of the pulp, which, with the exception of some few shreds, was in a watery condition. The apex was found to be so badly absorbed that amputation was decided upon. The canals were first thoroughly filled. A hypodermic injection of m. xx of a four per cent solution of cocaine hydrochlorate was then administered. The diameter of the fistula was considerably enlarged and the upper one-fifth of the root amputated. It became, however, a very difficult matter to remove the diseased portion. After drilling away a large amount of the alveolus it was still impossible to remove the end of the root. It was then decided to anaesthetize the patient, and as she was somewhat exhausted she was dismissed, after placing in the wound a tent of cotton saturated with aromatic sulphuric acid, and she was ordered *quinæ sulphas* gr. ij every three hours. On the following day chloroform was administered and the cavity had to be considerably enlarged by drilling when the end of the root was finally removed. These wounds all heal rapidly when the seat of the trouble has been removed and there should be no fear of making a large opening, especially when it has been necessary to resort to anæsthesia. In this case the density of the socket around a very long and tapering root rendered a very large opening imperative.

The wound healed rapidly under aseptic treatment and all that indicates the presence of the operation to-day is a very slight thickening of the alveolar plate at that point.

The record of these few cases is sufficient to indicate the absolute cure which follows this operation in chronic alveolar abscess and when it is compared with the uncertainty of every other method it is not unreasonable to ask: Why is it not performed more frequently?

#### PYORRHŒA ALVEOLARIS COMPLICATED WITH ALVEOLAR ABSCESS.

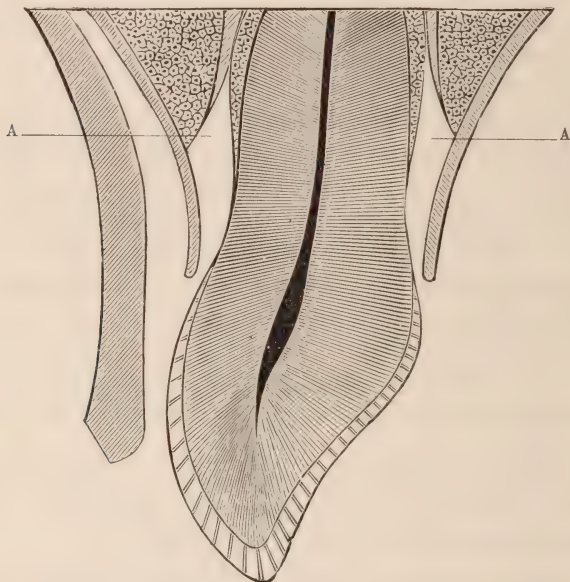
One of the worst conditions that we meet with in the various aspects of pyorrhœa alveolaris is where through the ravages of the disease, death of the pulp has ensued and there is added to the original septic matter the pus from the broken-down pulp. This condition generally takes place without any warning to the patient;

in fact it is impossible to learn at what time death of the pulp took place.

The powerful nature of the double septic condition soon causes absorption of the end of the root to progress more or less rapidly so that the purulent matter finds a free escape from the root and passes out through the channel furnished by the pyorrhœa pocket.

Consequently the diagnosis of such a pulpless tooth becomes a very difficult matter. The color remains good, even the electric mouth lamp generally fails to indicate that the pulp is dead,

FIG. 1.



A, pyorrhœal pocket.

because the canal is filled with purulent matter of such a watery consistency that it is rendered as translucent as though traversed by a living pulp. The only reliable diagnostic sign is to isolate the tooth by means of the rubber dam, and then to apply intense cold or heat. The smallest amount of the spray of chloride of methyl is admirably adapted for this purpose. We have all experienced the hopelessness of treatment of such teeth and a course of procedure which will enable us to preserve them for useful service may perchance be welcomed by the profession.

CASE IV.—Mr. P——, aet. about 36, came under treatment for pyorrhœa alveolaris in April, 1889. The disease was the sequence of an attack of African fever contracted during the first Stanley expedition. The history of the case is given on page 745, vol. x of the *International Dental Journal*. Though appearing hopeless at first sight, a thorough physical examination showed the organs to be in a healthy condition and a favorable prognosis was made. Treatment produced such marvellous results that in July I reported the case cured.

In December I saw the patient again and everything was normal except the superior right central incisor. The pocket had reappeared around this tooth and considerable suppurative action was discoverable. (Fig. 1.) The patient had been using an antiseptic spray continuously and the condition around the neck of the tooth was in marked contrast to the rest of the mouth which was normal. The pocket was given an extra vigorous treatment and the patient dismissed, and soon after the tract seemed to disappear and the parts to resume their normal condition.

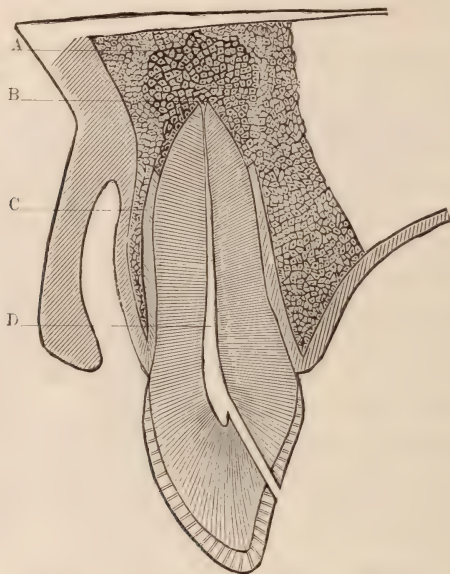
A few days later he began to suffer intense pain from the tooth. Being a resident of Brooklyn, at night he went to a prominent Brooklyn dentist for relief. After hearing the history of the case he ground away a portion of the cutting edge of the tooth, hoping in this way to relieve the patient. He could not sleep that night and was at my office the next day. The gum about the neck of the tooth appeared to be in a normal condition. The tooth was very sensitive to tapping, color was normal, electric lamp showed no opacity.

High up near the apex of the root on the labial side could be discerned some distance under the surface a peculiar yellow spot, having an angry look about it. An incision was immediately made to this point, which at once allowed an exit for pus and at the same time brought relief to the patient. This space led directly to the root of the tooth, which was discovered to be considerably absorbed and surrounded by soft, carious tissue. It was of course impossible for the pulp to be alive. The rubber dam was adjusted and an opening drilled through the palatal surface into the pulp chamber. This was discovered filled with pus of a watery consistency, with some shreds of pulp tissue still existing. The canal was thoroughly cleansed with a solution of mercuric bichloride in hydrogen peroxide, the syringing of which caused the medicament to come



through the labial opening. The aperture at the end of the root was very large. The root was then filled with gutta-percha and covered with oxyphosphate of zinc. (Fig. 2.) The opening into the labial side was packed with a tent of cotton soaked in aromatic sulphuric acid. Tonic treatment was prescribed and an appointment made for the following day. At that time no alveolar process

FIG. 2.



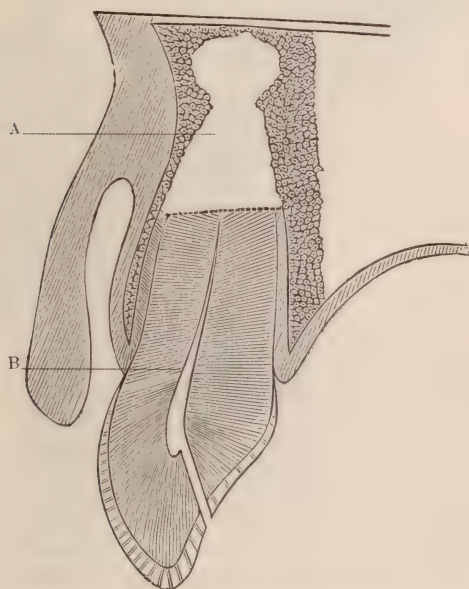
A, caries of bone. B, absorption at apex of root. C, pyorrhoeal pocket filled in with new tissue. D, root canal filled.

interfering, by means of a fissure-bur the upper one-quarter of the root was amputated and removed. The surrounding tissue was found to be carious up to the floor of the nose. The patient being somewhat exhausted another tent was placed in the wound and two days after he was anæsthetized and a large portion of the incisive fossa burred away. (Fig. 3.) The wound was thoroughly ascepticised and lightly packed with iodoform lint and patient directed to use a listerine spray every two hours. He was also put on a tonic of albuminate of iron mixed with the compound syrup of hypophosphite of lime. The dressing was removed every day, being replaced by a smaller one each time. The operation was so severe that it was three weeks before the parts were healed, the

patient being confined to his house for the first week. The result has been satisfactory in every way.

CASE V. Mr. T——, æt. about 53, of vigorous and healthy constitution. He had always taken fair care of his teeth, none of which had been lost. The deposit of salivary calculus had always been dense and rapid in its formation, necessitating very frequent attention to the removal of the same. Having somewhat neglected his

FIG. 3.



A, bone and portion of root removed. B, root canal filled.

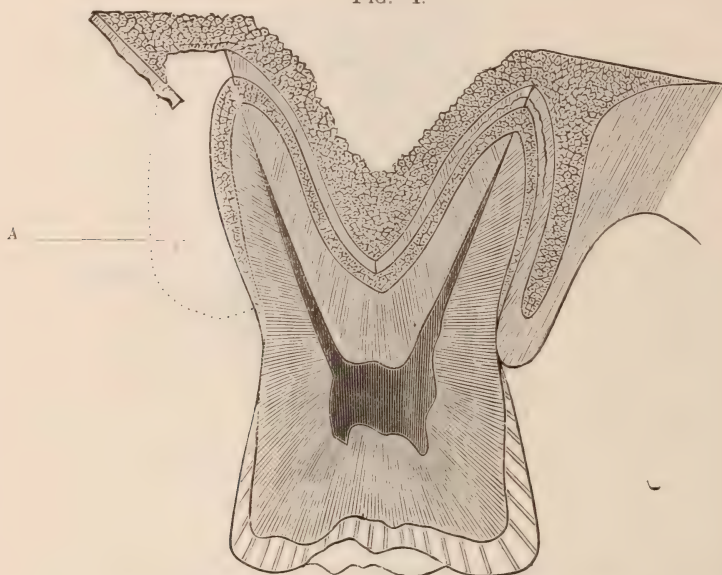
mouth he presented himself in 1889 for treatment. There was an extensive deposit of salivary calculus ; on removing which it became evident that the work of his previous dentist in removing the same had been very superficial. There was considerable tumefaction of the gum and a discharge of pus. Local treatment restored his mouth very speedily to a condition of health with the exception of the superior left first molar.

The palatine root of this tooth was entirely denuded of any covering on its palatal aspect down to the very point of the apex, its nerve connection having long since been severed. No filling

had ever been inserted in the tooth and there was no sign of caries. (Fig. 4.) The rubber dam having been adjusted, a hole was drilled through the centre of the crown, and the pulp, which was found in a very putrescent state, thoroughly removed from the three roots. They were then cleaned and filled as previously described and a permanent filling inserted over the oxyphosphate to close the opening in the crown.

A fine fissure bur was then passed through the palatine root

FIG. 4.



A, entire loss of covering over palatal aspect of palatal root.

close to the crown and the entire root removed. At the point of amputation another permanent filling was inserted. (Fig. 5.)

Two weeks later the gum on the palatal side was in a healthy condition, all traces of the imprint of the root had disappeared and the tooth which had been very loose was now firm in its socket supported by the two buccal roots.

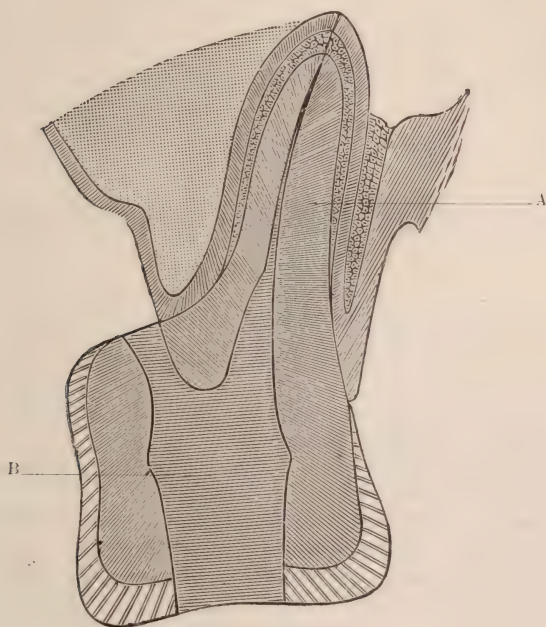
This is the most common class of teeth that we meet in which amputation of the roots is indicated. Not only do we restore to usefulness a loose tooth but we stop the absorption of a certain amount of purulent matter.

To briefly summarize: Wherever death of any portion of a root has taken place, the simplest cure is to amputate the necrosed



portion of the root and the tissue will close firmly about the remaining healthy portion, which will suffice to support the tooth. In

FIG. 5.



A, buccal root. B, filling.

teeth of more than one root, where often an entire root becomes necrosed, this may be safely amputated and the tooth generally be well supported by the remaining root or roots.

### DISCUSSION.

DR. RHEIN: I suppose all the gentlemen who were present yesterday during the reading of the two papers from this section, recognize a great similarity in the cases reported by Dr. Hugenschmidt and the two cases which I reported of pyorrhœa, complicated by an alveolar abscess, and from a careful perusal of Dr. Hugenschmidt's cases I conclude that he had observed cases very similar to those which I presented, only his had not reached the stage where the pulp had died, though they show a marked tendency in that direction. I believe his cases represent simply a primary condition of the disease, the result of which was portrayed in figures 1, 2, and 3, which I presented.

## PROSTHETIC DENTISTRY, METALLURGY, AND CHEMISTRY.

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By W. B. AMES, D. D. S., CHICAGO.

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Section I. Offers for your inspection as novel, two instruments devised by L. M. Mathews of Lawrence, Kansas :

First, A combination pliers for measuring roots, bending and contouring bands and for punching plates.

Second, A blowpipe to be used with mouth blast, bellows or nitrous oxide, which commends itself by its convenient form.

Of papers, we have to offer, first, "Amalgamation and Dental Amalgams," by Dr. Stubblefield, of Nashville, Tenn.; second, "A System for Constructing Porcelain Front Crowns," by Calvin S. Case, of Jackson, Mich.

In connection with this subject, E. Parmly Brown will describe, with the aid of drawings, an improvement in the porcelain crown presented to this association at the meeting of 1885.

The section have also examined the Floyd porcelain teeth, in which we find features which give them valuable practical utility.

## A SYSTEM FOR CONSTRUCTING PORCELAIN FRONT CROWNS.

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BY C. S. CASE, M. D., D. D. S., JACKSON, MICH.

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From the time that crown and bridge dentures were introduced to the profession of dentistry, they have steadily increased in popularity, until to-day they take front rank in the prosthetic department. Indeed, the demand for this class of work has become so widespread that proficiency in the art of its construction is considered by laymen almost indispensable to the repertoire of a "first-class dentist." And as methods and skill become more perfected, the permanency, usefulness and pleasure which is derived from dentures of this class forces us each year to bow with greater deference to the voice of the people.

In the vast variety of methods which have been presented, many have been found insufficient and impractical; others, because of the difficulties of construction, have not come into general use; and while in the main the trend has been toward that which required of the dentist the least amount of time and skill, as mechanical ability has increased, there has been a constantly increasing growth and perfection of methods which insure permanency, with physiological and hygienic requirements.

I think I may truthfully assent that a large majority of the profession are united in their approval of the band or ferrule extension around the root; but always with the provision that it be made according to exact principles and requirements, *i. e.*:

(1.) That the peripheral surface of the root be so shaped as to make it possible to fit a band which will leave no V-shaped space between root and metal that cannot be closed by subsequent burnishing.

(2.) That the band extend beneath the border of the gum only



so far as to subserve the purposes of strength and prevent the lodgment of food along its edge.

(3.) That the material of which the band is made be thin enough and of a quality which will admit of easy and perfect adaptation to all the inequalities of the root.

Though modes of procedure differ in the attainment of these objects, there is no material difference in the result when the operation has been skillfully performed. In all subsequent steps, however, in the construction of crown dentures—notwithstanding the variety of methods already introduced—I believe there are still many opportunities for improvement.

It will be the object of this paper to suggest certain improvements in the construction of the so-called “Richmond” porcelain front and other tooth crowns.

In preparing the face of a root for a “Richmond” crown on any of the six anterior teeth, a most common method is to cut the root squarely off and bevel it anteriorly even with, or below, the margin of the gum. (See Fig. 1.) To the cap which is made for this a

FIG. 1.



Side View.

backed porcelain face is fitted and soldered. The objections to this method will be seen, I think, as I describe in detail another method of making a cap, which will be found in practice easily constructed, well adapted for every requirement, and of more universal application. This was first described by me in the June, 1888, number of the *Ohio Journal*, though used in my practice as early as 1886.

FIG. 2.



Front View.

Dress the face of the root in conformity to the curved border of the gum, as in Fig. 2; the labial edge slightly beneath the gum,

while the palatine may be cut only to the palatine prominence. After the enamel has been cleaved off and the peripheral surface of the root prepared, make the ferrule or band (preferably of pure gold) sufficiently long to hang down from the root—when adjusted to place—about one-half the length of the required crown. Mark on the outside the festooned border of the gum. Remove and cut out a scallop, front and back—on the front even with this line. Re-adjust and dress down with a corundum stone until the edge of band and root, anteriorly, are slightly beneath the margin of the

FIG. 3.



Front View.

gum. The proximate extensions of the band being left—as in Fig. 3—to fall along the sides of the porcelain face.

Now bend a piece of platinum, no thicker than writing paper, into this curve before or after removal of the band; solder, trim off surplus and finish. See Figs. 4 and 5. You now have an imper-

FIG. 4.



FIG. 5.



vious cap, the peculiar shape of which offers the strongest possible mechanical attachment to the root; one which is out of sight from the front when properly fitted with a crown, and, what is of more importance—in so far as it tends to limit the bewildering variety of modes—one which can be easily and successfully used as a base for the so-called “Richmond,” the Ash, Case and Logan crowns.

When the cap, having been made, is placed in its position on the root, its labial border should fall slightly beneath the festooned

margin of the gum. Take bite and an impression in plaster of the immediate section and make antagonizing models, with the cap in position on the model. You are now ready to fit—at the laboratory lathe—the porcelain tooth for any of the above named crowns. It is perhaps needless to say, in all instances where the cap is not drawn off with the impression, it is removed from root and placed in position before pouring.

A prominently unfortunate and deleterious obstacle, from a hygienic standpoint, has always existed with crown, bridge and metal plate dentures, because of the exceedingly unpleasant possibility of food and decomposing substances finding lodgment in the unavoidable spaces where porcelain has been held mechanically against metal surfaces by pins and solder. This, I am happy to say, can be obviated by the use of what is popularly known as "Jewelers' hard enamel"—a material similar to that which has been used from very early times in various processes of enameling jewelry, etc. It is principally composed of an easily fusible silicate, or glass; the white opacity and different colors being produced by the addition of metallic oxides,—a full description of which may be found in any encyclopædia.

The possibilities of this material in prothetic dentistry occurred to me after seeing Dr. A. E. Matteson demonstrate its use for porcelain inlays at a clinic of the Chicago Dental Society last winter. I first experimented—as you may do in the absence of something better—with enamel broken from old watch dials and ground to an impalpable powder. When this is mixed with water into a thin paste and used as an imbedment or luting between backing and tooth, and in all spaces where porcelain and metal come in contact, the subsequent heat required in soldering will fuse the enamel, and, not only form an impervious stopping against the ingress of secretions, but add greatly to the strength of attachment.

For the so-called "Richmond Crown" select porcelain face, and back with enamel as above, leaving the pins extended, if desired, to grasp post. At this point solder may be flowed around pins, to fuse enamel and prevent displacement during the grinding and fitting process. Another way, and one which I think I prefer, is to cut the platinum backing a trifle larger than the porcelain face. Dish it slightly, fit, and bend the pins so that it will be drawn closely to place. Now, when the moistened enamel powder is laid upon the extended edges of the backing, and the piece



tapped lightly, it will readily penetrate and fill the space beneath, at which juncture it may be fused without soldering, either under a blow-pipe or, preferably, in a gas furnace. (For all purposes of this work I am pleased to recommend "The Parker Improved Gas Furnace.")

Now grind face to fit the cap on the antagonizing model—allowing the proximate extensions to fall along the sides of the backing, and the cervical margin of the tooth to stand slightly in front of the cap; subsequently rounding and finishing the edge to the band.

By all means do not follow the slovenly practice, which is altogether too commonly pursued, of leaving a sharp, prominent edge of tooth to force its way into the gum, with a V-shaped space behind for the lodgment of food and final irritation and absorption of tissue.

Finally prepare root canal, replace cap on the root and punch hole for post—place parts in position—secure with plaster, remove and solder. See Fig. 6.

FIG. 6.



Another method, and one which will be found quite as satisfactory, is to prepare the root-canal and take plaster impression with post and cap in position; also a bite in wax; afterward being guided entirely by the plaster model of adjoining and antagonizing teeth, in fitting and soldering the crown to its proper relative position. Again, the post may be soldered to the cap before the impression is taken. In either way an undoubtedly perfect plaster model must be made, in order to correctly align and antagonize the crown without further access to the patient till the work is completed.

If for a long bite crown, requiring much material to bring the posterior surface even with the surfaces of proximal teeth, a shell may be struck up, fitted and soldered to the adjoining edges of cap and backing, with less work and material, and with the production

of a crown of natural contour and sufficient strength—the peculiar proximate elongations of the cap being well adapted for this mode of procedure.

The Ash & Sons tubed teeth, which are little used in this country, are admirably adapted for all long bite crowns, being exceedingly strong and of a material which admits of reshaping and polishing in any part without injury to the surface. When used for a crown with a cap and band extension—and with the especially valuable adjunct of enamel, as will be described—where they can be used, I see no reason why they should not be among the most useful and permanent as they certainly are the most beautiful and easily constructed crowns.

The impression having been taken and antagonizing models made with the cap in position, as described, the proper tooth having been selected it should be ground and fitted with great nicety to the curved surface of the cap—the proximate extensions falling along the sides to strengthen the crown and prevent rotary motion. While in position, mark and bore hole in cap for post (clasp metal), which should be drawn to exactly fit tube in tooth. Adjust cap to root and bore through this hole into canal—remove cap and, being guided by the marking, prepare root for post. Replace cap, tooth, and post, and if necessary, bend the post so that the tooth takes its proper relative position. With cap and post in position secure with plaster—remove and solder them together where the post passes through the cap. (See Fig. 7). The tooth is now adjusted and finally fitted to cap—the post and surface of cap roughened to secure a firm attachment of the enamel in which the parts are finally luted to place and brought to the required heat for fusing. (See Figs. 8 and 9.)



FIG. 7.

If the enamel is finely pulverized and mixed to the proper consistency when laid over a crevice with a camel's-hair brush and the tooth tapped lightly, it will be found to enter the smallest space. The excess of moisture should be dried with a napkin or bibulus paper and the work continued until the joint is filled. Where the

interspaces are wide, a second filling and firing will be necessary on account of the contraction of the enamel. If the fusing of the enamel is not done in a furnace, it would be well to invest.

FIG. 8.



FIG. 9.



The "Case crown" is the same as the Ash & Sons tubed tooth, with the exception that the tube is sufficiently large to admit of a second tube which was originally intended to be internally threaded and screw on to a Howe post set in the root. It is well adapted for a hollow post crown, through which the root may be subsequently treated. When constructed in the same manner described for the Ash, it makes a substantial crown, and one in which the hollow post may prove to be a valuable and convenient adjunct.

In fitting the Logan crown to the above-described cap, a slit is first cut in the platinum or gold face, through which the pin or post is forced—the porcelain being subsequently ground and fitted

FIG. 10.



like the others. (See Fig. 10.) When luted with enamel to the cap, and the post soldered (from the upper side) it makes a crown of considerable value, though not as easily constructed nor as perfect in strength or beauty as the Ash.

I now wish to describe a method for making porcelain-front hollow bicuspid and molar crowns :



Take an impression of the peripheral surface of the root with silver suture wire, and make a wooden model as described by me in connection with a method of making all gold crowns—published in the June, '85, *Cosmos* and republished in *Richardson's Mechanical Dentistry*.

The face of the root should be cut the same as described for the anterior teeth, and the curve reproduced on the wooden model. Cut strip of gold same width as for a Richmond hollow gold crown. By the aid of the model you will be able to outline a flap (a—Fig. 11), which, when partially cut, curved to fit the curve of the root,

FIG. 11.



and turned in upon the model, its edges should extend to the proximate sides of ferrule when in place, to which it should be soldered. The flap should be cut so as to extend only so far upon the face of the root as to meet the backing of the porcelain face, to which it is ultimately soldered. The portion cut out of the ferrule for the flap will leave about the right sized opening into which to fit the porcelain face. (See Fig. 12.)

FIG. 12.

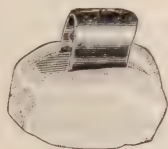


It is not always necessary to make a wood model as above. After a ferrule has been fitted to a root, experience will enable one to cut the flap the proper size; when it may be turned in upon the root itself and burnished to place—finally soldering the edges.

Now adjust the ferrule or cap to root and take a plaster impression, which, when filled, will be a correct model of adjoining teeth, with cap in position. A bite should also be taken so as to show antagonizing teeth. Select porcelain face, back as before, and fit in the laboratory, allowing the proximate edges of cap to fall along the edges of the backing as described for the anterior teeth. If sure of alignment the face may now be soldered. In this process

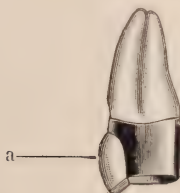
the porcelain only should be covered with a small investment. The hollow loop, through which the heat from the blow-pipe may readily pass, will enable one to easily solder the edges of the backing to ferrule and flap. (See Fig. 13.)

FIG. 13.



Cut the cusp of porcelain face diagonally to receive the gold protecting and antagonizing cusps, (See a—Fig. 14), which may be

FIG. 14.



swaged and filled or struck from a solid piece of pure gold. I prefer the latter—using a steel die-plate. The crown may now be replaced upon the plaster antagonizing models and the cusps fitted properly, articulated and finally soldered. (Fig. 15).

FIG. 15.



It will be observed, I think, that the contour in no large spaces is restored with masses of solder ; that solder is used only to close mechanically-fitted joints ; and further, the crown being two-thirds hollow, the post need not be soldered to it, but seated in the palatine root-canal and allowed to extend into the hollow space as in an

all gold crown. Again that these bicuspid and molar crowns are similar in construction to the crowns described for anterior teeth ; and finally the whole, because of their similitude may be adopted without difficulty as an adequate and complete system for constructing porcelain front crowns, and one which is especially adapted for college instruction, because—as I said before—it limits the bewildering variety of methods which are at present practiced. In closing, permit me to say: It is with no ambition of gaining special merit for originality of design in detail, but rather with a view of presenting to this, the highest tribunal, for their consideration, a scheme by which many dissimilar forces already in the field may be mobilized and marshalled under one head, and their management perfected and simplified for general practice and college work.



## AMALGAMATION AND DENTAL AMALGAMS.

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BY D. R. STUBBLEFIELD, M. D., D. D. S., NASHVILLE, TENN.

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Amalgamation is a very old subject, and yet it is a new one in the sense that it is not understood. Of course it is not supposed that there is anybody who makes any pretensions to respectable acquaintance with our profession, who does not know that a combination of one or more metals with mercury forms a compound that we know as amalgam. Nevertheless, it is confidently claimed that the full nature and special characteristics of this interesting combination of metals is not clear in many minds. Further than this, it is known that some even in high places have displayed complete ignorance of everything in connection with its nature except the practical working from a dental standpoint. As this is certainly not commensurate with the high claims that we make for professional standing, the present contribution is made without further apology and with the philanthropic hope that some of the younger men present will feel themselves better informed after it than before. Further than this, little if anything is expected.

The careful listener possibly noticed that it was stated above that the full nature and special characteristics of amalgams were not clear in many minds. We propose to be more accurate now and state that such explicit knowledge is not in any minds regarding the intimate nature, actual and comparative, of amalgams. To speak paradoxically, however, it is because so much is known that is not known, that we venture to call it up at all. Speaking practically, much is known regarding dental amalgams and this we shall present later on.

The remote history of combining metals with mercury is obscure. The philosopher who discovered it is unknown, although history shows that the metals with which it readily unites were known to

the ancients before mercury. It appears that gold, silver, copper, tin, lead and iron preceded it chronologically, for neither Moses nor the older Greek writers who speak of these, make any mention of mercury. Theophrastus, (300 B. C.) seems to be the first to mention it, and he gives a method of preparing it from cinnabar (the sulphide), and he calls it "liquid silver" from which we get quicksilver. The first references made to its combining with other metals, however, we find in later works.

Pliny, middle of first century, says that "all things float in it except gold and that alone combines with it." From that on we find statements, more or less definite, showing that the knowledge of the solvent power of mercury upon other metals was a laboratory tradition. The principal use made of this knowledge by the ancients seems to have been in the recovery of gold, and their method in this connection may be seen to be not very dissimilar to that method of to-day.

It is not our intention to burden you with long quotations from the writers down through the centuries, for such details would be useless when it is possible to extract from them such facts as are pertinent to our present aim. The special point aimed at now is that the union of mercury with other metals—amalgamation—has long since assumed that definite nature that belongs to recognized chemical compounds. At the same time it is not our purpose to make before you a protracted study of various experiments conducted by reliable investigators, which, while interesting, would prove cumbersome here. We can, however, call attention to the phenomena observed and show in which they resemble, and in which they differ, from other substances entering into chemical union. In the matter of the evolution of heat, we find an interesting point. It is quite well known that ordinarily molecular activity is attended by the evolution of heat, familiar to us all in the heat produced by uniting water and sulphuric acid, or water and calcined, pulverized calcium sulphate. These always evolve heat to a greater or less degree. In amalgamations, however, we find that heat is rendered latent in some cases and evolved in others. This was first remarked by Demachy in 1774, from his observations upon tin amalgam and, also, from mixing lead and bismuth amalgams. Little investigation was made along this line for something more than 100 years, when J. Regnauld found that heat was absorbed in the combination of mercury and zinc, and was evolved in

the union of mercury with cadmium. This same experimenter found that amalgamation caused metals to change their places in the electro-chemical series, becoming more electro-positive when heat was absorbed and less electro-positive when heat was evolved. In the first class—heat absorbers—he placed zinc, lead, tin, iron, nickel and cobalt; and in the second—heat evolvers—he placed sodium, potassium and cadmium.

Others have corroborated this experimenter's results, especially regarding the reduction of temperature. Phipson stated that 207 pb. 118 sn. 284 bi, and 1617 Hg. at  $170^{\circ}$ , was reduced to  $10^{\circ}$  when amalgamated, causing a fall of  $27^{\circ}$  of temperature.

It has been definitely ascertained that mercury combines in regular proportion like any other chemical union. We have formulæ for expressing the compounds resulting from a union of Hg with the metals of the alkalis, as  $\text{Hg}_{12}\text{K}$  or  $\text{Hg}_6\text{Na}$ , and many other single metals associated with mercury, but as yet we have not seen any compound formulæ to set forth such complicated compounds as our dental amalgams. It is possible that the demand for exact chemical statements among our profession has never been such as to stimulate supply. It will not be long, however, before equal exactness will be just as much the rule in regard to complex as simple association united chemically.

In the matter of conducting heat, Calvert and Johnson published that tin amalgam was the best conductor and bismuth amalgam the worst; and that in each case the conductivity increased with the decrease of the mercury in each amalgam. It is to be regretted that they confined their investigations to tin, zinc and bismuth, for a point of great practical interest lies just beyond and hanging upon such a conclusion. As it is, it might be worth something to the manufacturers of dental amalgam to introduce *bismuth* into their products, as it was the poorest conductor of heat. And in extension of the same idea, the fact that the ratio of decrease of mercury was the ratio of the increase of conductivity suggests the thought that something of a practical nature might easily be elaborated. The subject of thermal shocks is of too much importance for us to neglect to take advantage of any offer from the scientific laboratory. It is customary to hear each manufacturer boasting that his special compound has less of mercury in it than any other, but in the light of this knowledge we should hear just as vigorous



recantation. If there are any present practically interested, it might be well for them to stick a pin at this point.

In regard to the electrical conductivity of amalgams, the results show that the presence of a small quantity of a foreign metal in mercury causes a rapid decrease in the resistance. The conductivity is not the mean of the constituents. This seems to be practically an argument against the use of amalgams, but as it is a moot question as to the real merits of electrical currents in and through the body, the subject could not thus be summarily settled. The alloy of mercury, bismuth and lead conducts better than either of its constituents. In the case of tin and cadmium, and bismuth and lead, we have two groups that act singularly. If tin or cadmium is added to mercury the resistance rapidly decreases as the per cent of the metal increases, and more and more approaches a fixed limit, while if bismuth or lead is added the resistance decreases to a minimum and then rises to a maximum.

Without dwelling longer to present others observations we may readily conclude that amalgamation produces chemical compounds, more or less unstable and uncertain in their actions under examination. The fact that heat is absorbed instead of being evolved does not argue against the chemical nature of the combination, for the excess of mercury would doubtless absorb more heat than is produced by the new formation. The definite amalgams, as far as they are known, are crystalline in structure and it may be that instead of dissolving in mercury as salt does in water, *i. e.*, breaking down to the molecule, the mercury disintegrates the alloy to nothing smaller than the crystal unit, so that when the mass is squeezed through chamois leather the crystal units which have collected in masses of sufficient size cannot pass through the pores of the skin, while the smaller masses and the single crystals are readily forced out.

The history of amalgam, however, from the standpoint of the dentist is not so old. Many of those present doubtless recall its earliest advent. I have been unable to obtain any authentic account of its first discoverer or the one who presented it first to us. Filing silver coins for use in this way seems to have constituted the first alloy devoted to it, and yet at this early date no idea of preparing special alloys for the purpose, seems to have entered into any mind. At first not only was the use of it treated with suspicion, but actual enmity and outright opposition was developed.

Whether this precarious condition of existence was the cause or something else. I do not know, but everything in connection was vague and uncertain. Those who dared to use it felt guilty, and like Peter were ready to swear they did not *know* it, much less use it, when confronted by the accusation. It was a sort of "moon-shine" business throughout, and the great wonder is that it survived such powerful and unrelenting, and indiscriminating persecution. For a long time nothing definite could be known of its qualities, and if there did not exist the law in nature and all things else called the *survival of the fittest*, it would be known to-day only as a tradition, only as a folly that died a natural death. But such is not the case. It still lives and has asserted itself, so to speak, in the very teeth of its defamers, and holds to-day a more or less conspicuous place in almost every office in the land.

Owing to this uncertain tenure upon existence, as cited above, it is not to be wondered at that little if any method governed its early preparation. Empiric combination of almost any metals, so they differed, was the vogue, hoping thereby to accidentally discover something that would render its use respectable among dentists and its user entitled to consideration, if not equal respect with his brethren. It would render this article intolerably long, however, to attempt a detailed account of what was done, even if I could possibly obtain a correct history; and as such a narration would be useless, no such effort has been made. Suffice it to say, that varying compounds presented as diverse qualities as they themselves were various. All of them would not answer well as dental amalgams. They did not have sufficient edge-strength, or did not keep their color sufficiently well, or did not resist the disintegrating effect of saliva, aided by heat and moisture and the adventitious presence of organic acids, resulting in the discoloration of the tooth-structure by unsightly sulphides, or they had special tendencies in themselves to expand or contract when setting. These properties, by the presence of some metals and the exclusion of others, were gradually brought within control.

From a practical view of the subject, the influence of the different metals is full of interest. Tin unites readily with mercury, making a smooth, unctuous compound, but it sets slowly, and when it is crystallized it is not sufficiently hard to resist the force of mastication. Then there is a marked tendency in this union to assume the globular form, causing it to leave the edges and bulge

up in the center. Its value then is almost entirely destroyed by these objections.

Silver, while it does not unite as readily as tin, will slowly yield to the power of mercury; but, it also has the objectionable trait of setting slowly. In addition, it has the tendency to expansion, though not in so marked a degree as that of tin and mercury. This expansive quality, it may be remarked, has been denied by some investigators, who claim that on the contrary it first contracts in setting and finally expands to a dangerous extent, when the force of expansion is exerted upon the lateral walls of a tooth.

Gold seems to unite readily with mercury, but it requires some time and even elevation of temperature to insure perfect and uniform admixture. When mixed it does not harden to a sufficient extent to give a good dental amalgam.

Platinum does not unite readily with mercury, but a smooth amalgam can be obtained by rubbing finely divided platinum with mercury in a heated mortar. It does not harden well when combined, though it quickens the setting.

Copper, also, does not unite readily with mercury, and requires heat to induce union. When obtained in a very finely divided state by precipitation from some of its salts in solution and heated, it may be quite readily brought into union.

Zinc forms with mercury an exceedingly brittle amalgam, as might be expected, which has no use whatever to the dentist as an amalgam. It plays a part, however, in contributing valuable properties which we shall note in our conclusions.

The foregoing metals, while not composing the entire metallurgical list, about represent those constituting the valuable ones to the dentist. We have seen that, with greater or less facility, they all combine with mercury, but that no one is able alone to yield with mercury a satisfactory compound to meet the requirements for a perfect dental amalgam. Tin makes an unctuous plastic, but is too soft and expansive when set; silver makes a smooth compound, but does not give a safe result; gold unites at all temperatures, but does not get hard enough for use in the teeth; and platinum and zinc yield more or less slowly and yet form too brittle amalgams to meet the demands. It is only when the crossing and intermixing begins that we obtain the qualities we desire.

The easy plasticity of tin forms a good basis upon which to introduce the less yielding metals; while they in turn control the



tendency of tin to assume the spheroidal form and give the requisite hardness to the resulting compound. Strange to say, gold that unites apparently readily though really with reluctance, hastens the slow action of tin, and while not fully meeting the demand tends to harden the resultant. Platinum, true to its colors, yields reluctantly at all times and gives quickness to setting, and brittleness to results. By a judicious throwing together of several of these constituents, each with its own individuality contributing to and modifying the whole, practical workers have been enabled to reach satisfactory combinations. The greatest care should be exhibited in the combining of these metals, differing as they do in fusing point and in other particulars, so that the alloyed stick or mass should be thoroughly uniform. Then another point, which has not been sufficiently emphasized ordinarily, is that each different combination should have just a certain quantum of mercury added to yield the best results that it is capable of. The average dentist is very negligent, not to say ignorant or indifferent, about the way he gets his plastic into workable shape. Each compound—to repeat—should have just a definite quantity of mercury to bring out its best qualities, and the results are modified very much by the excess at one time or the too little plasticity at another.

The action of zinc in amalgams, referred to above, when present in a very small proportion, seems to control the expansive or shrinking quality, and then to enable it to keep its color against the darkening effects of the sulphuretted hydrogen and other agencies that discolor. Of late I have been partial to the compounds that contain this metal, and I think as good if not better results are obtained than from those that lay their claims for popularity upon their ability to render black themselves and the teeth. Copper amalgams, whether composed of that metal alone and mercury, or with copper as an incidental constituent, have been very loud of late years in claiming excellence.

I am perfectly willing to concede to them an equality but nothing more. I confess I cannot subscribe to the theory that claims therapeutic action through the permeation of the copper salts into the tooth structure. It seems to me that to have permeation we must have solution and to say that the filling is slowly dissolving away is to claim a very questionable property for it. I am willing to suppose and admit that copper salts have a germicidal power, but I am not able to see that these same soluble salts can be

obtained from the mass, put there to stop a breach, without a gradual loss of bulk, which in turn must cause it to fail to do its duty as a filling. Therefore, I say again, I am willing to yield to a claim for equality but not for superiority, unless the claim be based on other than its power to permeate the tooth with salts of healing derived from itself without loss of structure.

In conclusion, a few words about the use of amalgam as a filling. Fortunately or unfortunately for me, I was born into the profession after the day when a dentist of ability scorned the use of such a disgusting and discoloring filling material as amalgam. I was born, so to speak, when a better knowledge and a broader philanthropy was beginning to acknowledge the claims of genuine merit that such a plastic does possess. The profession was beginning to think that certainty might very profitably be substituted for uncertainty in such places as it was physically impossible to place the first portion of gold and then add the rest without ever displacing the first. The strength of a chain must always be measured by its weakest link, and the profession at large must be measured by a less high standard than the best and most skillful in it. It might, upon this hypothesis, be allowed that certain ones of the profession were able to operate infallibly, at all times, under all circumstances of daily professional life, and still the claim be justly made that the profession as it stood related to humanity could not claim to be universally on a level. And while I am not blind to the fact that if we never strive patiently and earnestly, and conscientiously to attain high ground in professional skill, we never will rank high as operators, still I claim that some can never reach that excellent estate. Therefore, I make the plea, although I am glad to say it is no longer necessary, for the use of *plastics*, inside of the pale of respectability in the profession.

Slovenliness and slipshod ways in anything are disgusting, and certainly they are so in a profession that is as exacting in the perfection of its details as dentistry, and I make no plea for such methods. I merely wish to claim that there are cavities, in certain mouths, that from the very nature of the disabilities under which the operator must labor, can better be filled with plastics than anything else by anybody.

My plea for the material itself is based upon this, that it has not had a fair chance in the world. It was born under adverse circumstances and under unpropitious stars, and it was at once

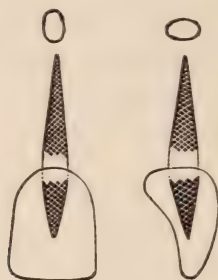
relegated in effect if not in fact, to the kitchen and the scullion. It was not used nor recognized by the best and most expert operators at all, and when it was tolerated it was merely to begin an unequal fight for existence as the custodian of a tooth, "not worth anything so expensive as gold." It has been sneered at and scoffed at since its earliest hour and yet like another "ugly duckling" it has survived disgrace, and I think the day is not far off when the best and deftest will hail it as the truest and best friend when their need is the sorest. Give it a trial. It is being given a show at last, a fair trial almost everywhere and by everybody, and it will yet convince the most skeptical that it has qualities that render it valuable in very many places. A year ago, in Galveston, I was taught that it was excellent for filling the canals of pulpless teeth. Since that time I have used it carefully and, I am glad to say, with better success than anything else I ever used as a root-filling. Dr. Miller, of Berlin, in his tabulated statement of the relative germicidal power of the various filling materials, puts copper amalgam at the head—the only one, if I remember correctly, that did seem to exert any opposition other than a physical one of *lockout*. If this is so, and if in root-canals we desire antiseptic power present, it seems to stand to reason that the practice is good. At any rate, I state it as true that it has been my friend for the past year in such cases. Therefore, I ask you to try it.



## A NEW PIN FOR PORCELAIN TEETH.

BY E. PARMLY BROWN.

DR. E. PARMLY BROWN: Since I presented to this association a taper-pin porcelain crown at Minneapolis, which was received so kindly, I have made an improvement upon the pin. I here have a diagram illustrating it. These pins are made in four different sizes, and tapered at both ends so that you can select the pin to suit the case you are working upon. The form of most of the channels at the cervical border is oval. The pin should be about the size of a normal channel. Never cut away the dentine to put the pin in place if you can avoid it. There is no rule to be laid down, but you should keep all the tooth substance you can, to avoid splitting. The pin is milled at both ends to hold better in both porcelain and cement.



## HISTOLOGY AND MICROSCOPY.

Dr. A. O. Hunt gave a lantern exhibit to demonstrate his theory regarding the blood supply to the dental pulp, and Dr. W. X. Suduth also gave a lantern exhibit illustrative of the minute structure of some oral tumors.

Owing to the inability of the exhibitors to furnish drawings in time, the illustrations could not be presented in this year's transactions.

## IOWA STATE DENTAL SOCIETY.

*(Continued from page 612.)*

Tuesday evening session, May 6, 1890.

A paper entitled "Olla Podrida," was then read by A. W. McCandless, D. D. S., of Davenport.\*

## DISCUSSION.

DR. L. C. INGERSOLL: My first words are to say "multum in parvo." The essayist seems to have covered almost the entire ground of operative surgery, or what we might call dentistry. There are a great many points of interest in it, to some of which each one could possibly take exceptions because they practice in a different way; not that they have any reason for a different practice, but simply that their practice is not his. There are one or two points I should think I could hardly accept: one is that we should never fill two proximal cavities in the same tooth at the same sitting. Now, we have patients who come from a distance or right in town so situated that they must have their work done at a single sitting, and I think we ought to adopt some method by which we could do it.

Take the matter of plaster: I have never heard of any one using my method of preparing plaster so as to avoid the adhesion of the plaster to the teeth. The adhesion is due to the great affinity of the plaster for water, and unless that affinity is perfectly satisfied in the adding of water to the plaster in making the mixture, it will absorb every bit of the luster from the teeth and then cause an adhesion. The first point then is that the plaster shall be thoroughly mixed. Have a large quantity of water—all that it would take up—and then wait long enough for the union to be complete; that is one point. The next point is that I would add to the plaster from one-third to one-half of pulverized pumice, according to the strength of the plaster. Some plaster would not take more than one-half, while others would take two-thirds of pulverized pumice; then it requires less water and the adhesion to the teeth is almost entirely prevented, and you get your impression out of the mouth with less liability to fracture.

I would use a matrix in filling with amalgam on the proximal surface.

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\* See page 582.

DR. E. R. MULLET: I think the essayist stated that in case of a large cavity of an incisor where there would be a possibility of destruction of the pulp subsequently, he would recommend destroying the pulp and filling the cavity at the same sitting. I wonder if he meant to destroy it by knocking it out with a stick of wood. I would not like to recommend this method for general practice. I do not believe I would like to have it done in teeth of mine.

I have succeeded in many cases in removing the pulp from the tooth and filling it at the same sitting, but not by driving a stick of wood into the pulp canal, but by putting crystallized cocaine on the pulp and removing by degrees from the cavity, uncovering the pulp and then with an instrument, having moistened the end with cocaine, place it on the pulp, and renew in ten minutes. This way the pulp can be removed with but slight pain, and not have the patient complain. If I had to undergo the treatment I should prefer that to a sharpened stick driven into the pulp.

DR. A. W. McCANDLESS: I think the method of knocking the pulp out with a stick is the best plan.

DR. L. C. INGERSOLL: I wish to say a word on that subject. There is more confusion in the minds of young practitioners concerning the mode of expressing ourselves concerning this matter of destroying pulp, than all else ever spoken of in a dental convention. A man arises and tells us how he destroys a dental pulp, in a manner which is impossible in three-quarters of the cases where he needs to do it. How do you do with the molars? How are you going to drive a plug in the pulp-canal of a molar? You cannot enter it with a cleansing instrument at all. The whole chamber is not thicker than tissue paper. How are you going to drive your stick into that?

There are six long teeth where this pleasant, agreeable mode of operating could be put into operation, but when you come to the bicuspsids and the molars the difficulty begins. Men talk of stripping the pulp out of teeth in a body, from all of the canals, from three roots at once. I heard that statement repeatedly, but I do not think it was ever done in this world. There is a possibility that such a thing might happen, but bare possibility is not general practice. We must learn what is usual and what is common.

DR. I. P. WILSON: This heroic method of destroying the dental pulp instantaneously is not a new thing. Thirty-one years ago—I



have just been counting up—thirty-one years ago I went to a man by the name of Pratt, Dr. Pratt near Wheeling, W. Va., with the two superior central incisors having exposed pulps, the teeth aching ; he took an instrument of some kind, I do not remember now, and as quick as a flash he destroyed the pulp in each tooth and took them out and showed them to me. It was thirty-one years ago and I did not realize anything about it until it was done. I remember the operation ; I have not forgotten that one sharp pain that I experienced, but it was instantaneous, and I would rather experience it this evening than to suffer the pains of having a sensitive cavity excavated and filled, because it is all over in one instant. But there is a great deal of truth in what Dr. Ingersoll has just said, and it is of a good deal of importance. The pulps of teeth are not usually destroyed in that way, when they are, as for people living at a distance, the patient should understand the reason. I do not understand how Dr. Mullet can go through the method he mentions and produce no pain.

DR. E. R. MULLET : The first case in which I applied that method was during the winter recently passed. A patient called to have a crown put on a root of an upper central incisor, and it was convenient for both of us to have the operation completed that day. To my surprise, when I began to operate, I found the pulp yet alive; knowing that cocaine had a benumbing effect I carefully opened a cavity to the pulp, and introduced some crystallized cocaine. In a minute or two I put some more on, and in about three minutes I could slightly enter the substance of the pulp with an excavator. I did not ask her how much it was hurting. I asked her afterward, after the pulp was removed if it hurt and she replied that it did not ; I continued applying the excavator to the pulp and after a while on probing into it perhaps a quarter of an inch, pricking it with the cocaine, in ten or twelve minutes I was able to thrust the probe in as far as I could, then twisting it around, I think I succeeded in removing the entire pulp. I would not expect to do this in the first or second molar, but in this case the cocaine was absorbed sufficiently to benumb the pulp to the apex of the root so that when drawn by the broach it would part there and come out entire.

DR. J. B. MONFORT, Fairfield : I wish to say a word in regard to the use of the matrix. I believe that there is danger of the young men depending entirely too much upon the matrix. I am

afraid of it and I believe that I can put in a filling on a proximal surface without a matrix. I feel better satisfied without than with one, and I believe a young man should steer pretty clear of the use of a matrix for several years, at least.

DR. ROGERS : I think a great deal of the matrix, especially my kind of a matrix. I think a matrix, such as I use is a very simple one. Probably some of you have noticed accounts of a similar one, or perhaps just the same one. It is not original with me except in the manner of using it.

[The doctor then illustrated the manner of making and applying matrices made of silver strips.]

DR. L. K. FULLERTON, Waterloo : In regard to matrices I wish to say a word. What I say may be old to some of you. Instead of using a metal matrix use mica. With a metal matrix it is almost impossible to make the proper contour at the neck of the tooth ; if you are using amalgam or any other material hard enough, the matrix will spread from the walls of the tooth and then you have a shoulder to trim off. If you take two pieces of mica and cut them suitably, inserting both pieces, take a tooth pick or whittle a little pine wedge, and press them in until you get a tight fit at the cervical border, the wedge holding the matrix in place. Using dry amalgam, within ten minutes the matrix can be removed and the filling polished.

DR. FRENCH : In regard to devitalization of pulps, I may say that we all know it to be objectionable to place arsenic in a tooth. We dislike to do it. Those of us who have had much experience know the dangers incurred when placing arsenic in teeth. If the drug is not properly sealed in the tooth we find inflammation of the gums, and I have known instances where the arsenic has penetrated to the alveolar process and caused considerable destruction. In a recent case I thought the preparation introduced was sufficiently sealed, but when the patient came back in about twenty-four hours I found inflammation and congestion of the gums, and four or six months afterward removed a large spicula of the alveolar process, which taught me a lesson. I have had success in the immediate extirpation of pulps in the six upper anterior teeth. I have had fair success with superior bicuspid. I never have tried it in molar teeth. I thought it wise to pursue some other course. In examining the mouth of a patient I found the pulp in the left superior cuspid exposed. He was a woodsman and said he had to go to the

woods the following day and there was only one thing for me to do; to leave the teeth go unfilled, leaving them liable to trouble him, or to remove the pulp immediately. I saw no other way except to apply the rubber dam and remove the pulp. The latter was exposed; I applied Squibb's chloroform freely, and after permitting it to remain two or three minutes with the engine wheel revolving as fast as it could, I placed a new bur immediately on the pulp, and the shock was so sudden that he did not experience any pain. With a new nerve broach, dipping it into pure carbolic acid crystals I pushed the broach as near the apex as I could, removing the pulp slick and clean. There was profuse hæmorrhage. I waited for a moment, then using clear carbolic acid crystals again, introduced the broach into the pulp canal, which caused a cessation of the hæmorrhage. After a few minutes I wiped the tooth out with a solution of bichloride of mercury. I then dried the pulp canal sufficiently, and forcing cotton on a very fine broach to the end of the root until the hæmorrhage had entirely ceased, I passed a little more carbolic acid as near to the apex of the root as I could. There seemed to be no pain on the pressure of the needle to the point of the root. The root was filled immediately with chloro-percha. A gutta-percha point dipped in the same solution completed the root-filling. I have followed this practice for the last six or eight years with the superior six anterior teeth and have been successful. I recall but one case where any periosteal inflammation followed. In this way there is less pain than when arsenic is applied. In removing a pulp, I never wait more than twelve hours, if the patient can come at that time. In removing a pulp there is less pain if it is done before inflammation sets in. I always have better success in my own practice by removing the pulp as soon as possible after making the application of arsenic, and I would rather remove a living pulp.

DR. I. P. WILSON: I have noticed in my practice, that by putting chloro-percha into a root first, and then dipping a gutta-percha point into the same solution, I have time to get the point into the root; otherwise the point will curl up.

DR. GARBER: In using cocaine for devitalizing pulps I have had a good deal of satisfaction. In the lower molar, after applying the rubber dam and after opening the cavity thoroughly, dipping a wood point into a fifty per cent solution and dropping the solution into all the canals. I then take a smooth bristle and gradually but



carefully, after having wrapped a few fibers of cotton around it, carry it down the side of the canal to the apex, waiting a few moments as I proceed (not much pain being manifested). In from ten to fifteen minutes I can remove the pulp in an almost painless manner. I have been doing this for several years; but I cannot do it successfully by simply applying cocaine on the external portion of the pulp. It has to be carried to the apex with a fine bristle. In doing that you carry the medicament to the proper point.

DR. C. J. PETERSON: The essayist referred to separating teeth by means of waxed tape. I would like to hear what some of the gentlemen have to say about separators. I use but little tape, preferring separators for anterior teeth. I find that it takes a long time, and one cannot get sufficient space in many cases, while with a proper separator more space may be secured and a better operation made.

DR. McCANDLESS: If I used a separator I should certainly always expect to destroy the pulp in the incisors.

DR. PETERSON: I do not wish to contradict the essayist. He thinks he would destroy the pulp. This is not the result when the separator is used with care.

DR. BROWER: I formerly was opposed to immediate separation and I thought the Perry separator, or any separator of that character, was the most cruel thing I ever saw used. I bought one and tried it, and now I would not be without a separator with which I could make immediate separation; space can be secured with less pain than with any other method that I have tried. I have found many dead pulps and I have found many complaints from slow separation, rubber and cotton and various methods that we hear spoken of.

[TO BE CONTINUED.]

# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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EDITOR: A. W. HARLAN, M. D., D. D. S.

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## AMERICAN DENTAL ASSOCIATION.

In this issue appears a report of the whole of the scientific work of the American Dental Association. Our readers who are not members, have in one number such a mass of interesting matter that we feel like congratulating them on the treat which is in store for them. American dental journalism is growing in its desire to spread before a constituency in a single number, the entire deliberations of a scientific association. We feel a conscious pride in our ability to cater to the wants of the dental reading public in this manner.

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## THE INCREASE IN THE PROFESSION.

At the late meeting of the American Dental Association, a prominent member of the profession from the south, in an eloquent outburst of patriotism and loyalty, incidentally defending the course of the average American dental college, made the remark that instead of there being any danger that the profession would become overcrowded, we really did not have a sufficient number of practicing dentists. Without further inquiry, it might so impress the casual observer, but a closer scrutiny of the actual figures will reveal the fact that dentists are being turned out of the colleges at a pace which may not be to the best interests of all concerned. We all understand that it is comparatively simple to manufacture professional men in the United States, that the mills are kept grinding at a rate which has made our educational system the laughing stock of the dignified scholarly educators of civilized lands.

In many respects dentistry is following in these footsteps and has adopted the methods of medicine. Its schools are established and conducted on a similar plan, in fact, often in connection with medical schools. The misproportion of medical men in the United States, when compared with other countries, is simply ludicrous. France, with a population of thirty-eight millions, has less than 12,000 doctors, and graduates 624 medical students a year. Germany whose population is about forty-five millions, has about 30,000 doctors, and graduates 935 students per annum. The United States, with a population of sixty-three millions, has about one hundred thousand doctors, 13,000 medical students and graduates 3,740 medicos per year.

The medical profession is absolutely alarmed at the present condition of this morbid growth. We are rapidly approaching the same condition. Last year the number of graduates was largely in excess of the demand and the increase over previous years out of normal proportions. There might be no special cause for complaint if every graduate turned out, was really a capable man and an ornament to the profession. But this is not true. Many, by the incompetent methods they pursue will only be the cause of others entering the schools, because they feel that the ranks of our profession seem supplied with poor material. The proper rigor of preliminary examinations and the three years' course which goes into effect next year will undoubtedly do much toward remedying the impending evil.

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#### WHAT ENERGY HAS ACCOMPLISHED IN THE PROFESSION.

When dentistry and hair-dressing were combined or allied pursuits there was little to indicate a future distinction of caste between the two callings. If anything dentistry showed to worse advantage. The tonsorial artist towered above the dental artist; in fact dentistry was not an art but merely the by-play of the barber. The cut of the hair was considered more important than the care of the teeth; the razor was worthy the constant attention of its owner, while the turn-key—the only dental instrument in use—was thrown carelessly into the rubbish drawer.

And what shall we say of the two pursuits to-day? Not much to be sure in disparagement of the one to the preferment of the other—that might be deemed indelicate—but modesty admits us



to claim for dentistry an honorable place among the learned professions. Year by year we receive more substantial recognition. Our services to humanity are making an impression on the world, and the name of dentistry carries with it an entirely different significance from what it did a few decades ago.

And to what must this change be attributed? Simply to the fact that men of discernment discovered the possibilities of dentistry, and men of energy applied themselves to the task of developing it. The labor of bringing the profession to its present status has been no mean undertaking; it has required the best endeavor of noble, self-sacrificing men, and the work is even now only in its infancy. But though young it is a healthy growth; there is much of encouragement in our present prospect. When we remember what a few years has done for us we are hopeful of the future. A short time since the man who could extract a tooth the most skillfully was considered the best dentist—it was the prime measure of his ability—but now the best dentist does not extract at all, or very seldom.

The turn-key of the tradesman has given place to the plugger of the professional man; the leech and the lancet are largely superseded by prophylactics and pain-obtunders. The dishonored corner in the barber shop has developed into the modern operating room filled with the best appliances the genius of man can construct. In short, dentistry has been taken from the mire and clay of empiricism, and has been placed by gradual degrees on the solid rock of science.

All this has been accomplished by the constant application of energy—energy judiciously and faithfully directed. And in the recognition of this fact do we gain our greatest inspiration for the future. That which energy has done for the development of dentistry, energy can do for the perfection of dentistry. But that energy must be properly distributed, and it must come from many sources. By slightly changing a trite axiom we may make our meaning clear:

ALL DESIRE KNOWLEDGE BUT FEW ARE WILLING TO PAY THE PRICE.

This is conspicuously true of dentistry. If we look into the history of the profession we shall find that its progress is due to the energy of a few. Take the number of dentists in the world to-day and place beside them the pitifully small per cent who are really

working for the advancement of dental science. The proportion—or rather the lack of proportion—must make us pause and wonder what we might not accomplish if the whole profession accepted the same responsibility that now falls to the lot of the few.

It is marvellous that dentistry has advanced as rapidly as it has, when we remember the small number contributing to its success. Its present status is a glowing tribute to that meager minority who have so unselfishly labored for its betterment, while the main body were following their own inclinations and shirking their duty. For a man does owe a duty to a profession the moment he adopts it as a calling and begins to make a livelihood from it. He owes it his best allegiance, his deepest thought, his greatest endeavor. He should not sit idly by and drink of the sap from the tree of knowledge planted, reared, and nurtured by other hands. He should do some of the planting himself—some of the nourishing. He should add fresh grafts as often as his ability admits, and should give freely of the fruit to the profession.

Compared to the number of men in practice, the number who belong to dental societies is deplorably small; and yet the men who are not in the societies profit immeasurably by dental association. They gather ideas from the reports that otherwise they would never get; they secure the knowledge, but are not willing to pay the price. This is a sort of petty pilfering—it is unmanly and unjust. But the redeeming feature with this class of men is that in all likelihood they are not aware of the wrong they do the profession; they have never looked at it in this light. It is with most of them simply a matter of neglect, and we have hopes that in an impartial consideration of the question will bring many of them into the societies. There is room here for missionary work.

And how many are there who write as much as they ought for periodical literature? Pick up the dental journals month after month and watch the contributions. We find the same names occurring again and again—the few are doing the work, are paying the price.

How many among us take pride in collecting a library? How many think for a moment of the necessity for developing a literary spirit in the profession? A profession can live permanently only as it creates and fosters a literature of its own, and in order to do this effectually it must draw literary support from most of its members. In this educational age every dentist should be so equipped

that he may add something each year to the permanent records of his profession. If all should do this how soon would dentistry advance into prominence, and how substantial would be her reputation!

Our members have it within themselves to elevate the profession to a plane heretofore unapproached, and we have this one plea to make to every chance reader of this article: Before you dismiss the subject from your mind pledge yourself to the performance of something—no matter how minute—that shall make the profession better for your endeavor. Do this as a special favor to us, as a consolation to yourself, and as a duty you owe to dentistry.

### FEES.

Discussions are occasionally made interesting by speakers in dental meetings who refer to dentist's fees for professional services. At a late meeting of the Chicago Dental Society a few gentlemen incidentally touched upon this question, and much difference of opinion was expressed as to the advisability of making itemized bills for patients or otherwise. We are unable to state the general methods of presenting accounts for professional services in different communities. In Chicago it seems from the discussion that two methods are in practice: One to render the items, copied from the dental register, and the other simply for professional services. The accounts would be like the following:

CHICAGO, September, 30, 1890.

MR. J. JONES:

To GEO. W. JERMYN, D. D. S., Dr.,

To one gold filling.....	\$ 5.00
" " amalgam filling.....	3.00
" two cement fillings @ \$2.00.....	4.00
" one gutta-percha filling.....	3.00
" cleaning teeth.....	5.00
" one root filling.....	3.00
" one abscess treated (five sittings @ \$2.00).....	10.00
" one partial plate (rubber).....	18.00

Received payment,

(With thanks.)

G. W. JERMYN.

The second account might read as under:

CHICAGO, September, 30, 1890.

MR. J. JONES, Dr.,

To DR. ROLOP.,

To professional services to date (September 3, 11, 16, 20, 24, 1890).....	\$51.00
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Received payment,

F. R. ROLOP.



The first specimen probably has more adherents than the latter. In order to discover the methods of doing business, *i. e.*, presenting accounts, we invite expressions on this subject for our next issue. Communications should be accompanied with the bill-head or account in use by the gentlemen sending us any article on the subject; our custom is to use the latter form of account.

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#### DR. DICKINSON'S LECTURE.

We feel like commending strongly to our readers a perusal of Dr. Dickinson's article in this number. It is the best presentation of the subject, in compact form, that we have seen. The article exhibits such a depth of research, and such a familiarity with the literature of the subject that we have much pride in publishing it. It will repay reading and studying.

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#### DRYING ROOT CANALS.

No matter what method be used for accomplishing this desirable object, we fear too little attention is given to it to secure the desired end. The evidences of careless methods and practice in this important operation are so numerous that we feel compelled to plead for its better performance. It is impossible to properly fill the root of a tooth with wood, metal, cements or gutta-percha unless the root be thoroughly well dried. It goes without saying that the rubber dam should be used. The opening into the canal should likewise be of convenient access. If hot blasts are used, all the moisture possible must be removed with absorbent cotton, punk or paper. This is a necessity if the Woolley or other root dryer is used. Few operators, we opine, are owners of electrical paraphernalia necessary to accomplish desiccation of root canals. Alcohol and chloroform or glycerine cannot be relied upon without the further aid of heat or hot blasts from syringes. If the operation of root-drying is properly and faithfully performed, there will be fewer cases of pericemental inflammation, and still fewer of abscess, following the filling of roots. Our readers who may have any particularly effective methods of doing this delicate operation, will oblige us by communicating the same for the benefit of readers in general.

## DOMESTIC CORRESPONDENCE.

## THE TENTH INTERNATIONAL MEDICAL CONGRESS.

BY W. C. BARRETT, M. D., D. D. S., Buffalo, N. Y.

In attempting to comply with the request of the Editor of this Journal to give its readers some idea of the Tenth International Medical Congress, it is a little difficult to select a proper starting point. A connected account could only be presented by commencing with its organization. But I assume that this is unnecessary, and will, therefore, simply attempt briefly to sketch its appearance and speak of the work accomplished.

In the first place the congress was the largest ever held. There were 5737 names registered, and there were enough of those taking part in the proceedings but who were not regularly registered, to make the number fully 6000. About 1000 ladies accompanied the delegates. The United States, notwithstanding the great distance, sent more representatives than any foreign nation, the number being 659. Russia furnished 429 members, Great Britain 358, and France 179. The last was an unexpectedly large number, for it was anticipated that the French people could not forget national antipathies, and would be conspicuous chiefly by their absence. The result proves that in scientific pursuits race animosities are forgotten, and that there is one common ground upon which all people can meet in amity.

Rudolph Virchow, the leading pathologist of the world, was the President, and delivered the address of welcome at the opening, which was in the immense "Circus Renz." In referring to America, he expressed the great admiration which Germans have for the American medical profession, which he declared is pre-eminent in surgery, midwifery and dentistry. This was rather an extraordinary admission for a German, and shows that Section XIV was fully recognized as an integral part of medicine. Prof. Virchow went on to say of Americans—"We admire their scientific zeal, and envy their extraordinary skill, and shall try to imitate their push and energy. I find these latter virtues in the American student, as well as in the finished scientist. My German pupils usually spend some semesters in deciding what line of study they shall pursue and what department of medicine they will practice, while the American student steps into the arena with a definite

purpose and an unflinching determination to accomplish it. That is why Americans secure their laurels before their hair is white."

The Congress was formally declared open by the Burgomaster, or Mayor, of Berlin, who was invested by the Emperor with the royal authority. There was no lack of men eminent in the various departments of medicine, each country sending its most illustrious representatives, and some very important papers were read in the various sections, especially in that of surgery. There are few cities so admirably adapted for the holding of great meetings as is Berlin. There are sufficient great halls and buildings for the meeting of the different bodies, so that when necessary all could be accommodated near each other. There was something of the formality with which all such affairs are conducted in Europe, and to those who were visiting the Eastern continent for the first time, and who were ignorant of the language, it was not easy to fall into the current of affairs and to comprehend that which was readily comprehensible to those who knew the German language and German ways.

All agree that the hospitality shown was remarkable and unbounded. The management was in entirely competent hands, and there was very little of jarring or friction. A few there were who attended but one section, and who, forgetting that was but a comparatively small part of the Congress as a whole, complained that all was not subordinated to their own fancied wants, but the number was exceedingly small. Each section, perhaps, experienced some unavoidable inconveniences in its turn, but altogether the Congress was admirably managed. All suffered from the heat, which was something phenomenal for Berlin. The most of the section meetings were in the immense exhibition building, where the various halls opened into each other, and the confusion caused by people who either would not or could not comprehend the regular arrangement of the sections, was at times considerable.

A great many papers were presented in different sections, many of which from the lack of time, could only be read by titles. Dr. Koch, of Berlin, whose fame is world-wide, read one of the most notable. It will be remembered that he was the discoverer of the bacillus of tuberculosis, that scourge of the world, whose victims far outnumber those of any other disease. Dr. Koch is known as one of the most cautious of observers, who never makes an announcement until he has again and again proved its accuracy. Indeed, he has been censured for his exceeding carefulness and



the tardiness with which he accepts new hypotheses. It has been said of him that he never made a mistake in a conclusion, and has never been obliged to retract a statement once made. When, therefore, he announced that he had been enabled successfully to combat the effects of inoculation of pure cultures of the tubercle-bacillus in Guinea pigs, the significance of the statement may be comprehended by bacteriologists and pathologists, for Guinea pigs are the most susceptible of all animals to tubercular infection.

Sir Joseph Lister, of London, from whom antiseptic surgery or Listerism, derived its name, read a very important paper in the section of Surgery, dwelling especially upon the hypothesis of Metchnikoff, that pathogenic organisms are destroyed by leucocytes.

Dr. H. C. Wood, of Philadelphia, read an interesting paper upon "Anæsthesia," in which he combatted some of the theories concerning chloroform that are held as established in European surgical practice.

Of the entertainments offered the Congress generally, it is impossible to give an adequate account in the limits of this article. The banquet given by the City of Berlin at the Rathhaus, in its grand hospitality, was unapproachable by anything of the kind ever offered to such an assembly. That it was abused and turned into a scene of unbridled revelry by some, was a disgrace only to the individuals who forgot what was due to themselves and to the occasion. Unfortunately, even a medical congress is not exclusively composed of gentlemen.

It was, of course, impossible to accommodate in one place all who desired to attend the grand ball, and so there were a number held simultaneously at the Central Hotel, the Kaiserhoff, the Imperial, the Philharmonie and the Zoölogical Garden, members being given tickets for the place of their preference or for that which was most convenient for them.

The Emperor was not in Berlin during the Congress, he then being absent upon the imperial visits to other countries, which has occupied so much of his time during the past summer. But there was a court reception held by his brother, and there were imperial excursions to Potsdam and other places.

The dinners given by the residents of Berlin were almost innumerable, and there was probably scarce a member who did not receive an invitation to one or more of these. Then there were

receptions, both public and private, and nearly all places of resort and exhibition were opened to members of the Congress.

Finally, there was a special train provided for Carlsbad, in which were accommodated all foreigners who chose to accept the invitation, and all were entertained at the expense of the city, the honor of a special reception by the mayor and corporation being tendered them.

Everything that tended to the success of the Congress and that would add to the comfort or enjoyment of the members, was done by the city of Berlin and by the profession of Germany. That most of the delegates from America or England or France did not understand the language which must of necessity be chiefly employed, was certainly not the fault of the princely entertainers, and they were no more responsible for the consequent occasional lack of comprehension displayed by foreigners, than they were for the unusually hot weather. Hence the occasional growls of those who perhaps felt that not sufficient attention was paid to their own transcendent merits, were but tributes to the general excellent management which prevailed.

In the next number I will endeavor to speak specially of Section XIV.

[TO BE CONTINUED.]

#### DENTAL SECTIONS IN MEDICAL CONGRESSES.

*To the Editor of the Dental Review :*

SIR:—In an excellent review of the work of the late International Medical Congress at Berlin by an American M. D., published in the *Medical Record*, there appears the following characteristic passage :

“In estimating the value of such congresses as we have just had, one must at once admit that it does not lie in new discoveries announced, or new ideas evolved, or great original work presented. It lies rather in meeting with co-workers from other lands, in forming pleasant associations with these, and obtaining opportunity to exchange informally and freely opinions upon work in which there is a common interest.”

There is much wisdom in these words, and in them may be found the nucleus of the opinion so general among dentists of the United States, holding that the profession will advance more rapidly and become more useful as an independent body. What

exchange of opinions can a dentist, practicing dentistry, and a physician practicing medicine make at such a meeting? Even if at a medical congress there are no new discoveries announced or new ideas evolved; it is nevertheless true that the nature of dentistry is such that there can seldom be a gathering of any consequence, without the announcement of new discoveries or the evolution of new ideas. Now if dentists meet with a body of medical men, the above is the credit they get for the work they accomplish.

It is my impression that when we can have an independent meeting of dentists, centering the interest upon our own work, it need not be said that there was nothing new announced or evolved. In fact I am quite positive that at the meeting to be held in your city in 1893, dentists can show the world that when they meet, they do so not only to take advantage of the social features, but that the good accomplished will far exceed any similar previous effort.

I am delighted that the dentists who were lately in session at Excelsior Springs, Mo., had the good sense to sustain the principle of the independence of our profession by providing for such a grand meeting in 1893. The fossilized idea so tenaciously cherished by a few old men who never attended a medical college, that we are medical men, is rapidly becoming extinct.

Yours truly,

EX-MEMBER NINTH—NOT THE TENTH—  
INTERNATIONAL MEDICAL CONGRESS.

OCTOBER 2, 1890.

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1893.

*To the Editor of the Dental Review:*

DEAR SIR: In your August issue you ask if the dentists will be at the World's Columbian Dental Meeting. I can say, I think, for this part of the universe, every dentist who can rake and scrape up enough money to go, will be there. I know Chicago is a big place, almost as large as St. Louis, but you will have to spread out to entertain all who will visit you. The world never saw such a meeting as we will have in your city. Of course as you further your plans you will have what I might call a bureau of information. Every fellow will want to know where he can find board and lodging. This is a long way off and can be talked about later. We will from now until the time, rub up our old saws and pick our flints.

Yours,

B. H. CATCHING.



REVIEWS AND ABSTRACTS.

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A SYSTEM OF ORAL SURGERY, being a treatise on the diseases and surgery of the mouth, jaws, face, teeth and associate parts, by James E. Garretson, A. M., M. D., D. D. S., President of the Medico-Chirurgical Hospital, etc., etc. Illustrated with numerous woodcuts and steel plates. Fifth edition, thoroughly revised, with additions. Philadelphia : J. B. Lippincott Company, 1890. Cloth, \$9.00.

The new edition of this well-known work is a bulky volume of 1364 pages. As the preface states, it is "what oral surgery is and what dentistry is when practiced from the standpoint of oral surgery." The apparent purpose of the eminent author is to elevate and dignify dentistry by broadening its field to embrace the surgical care, of not only the mouth and teeth, but the face, nares, cranium, pharynx, trachea, etc., etc. In carrying out this purpose of study the author brings to his work a vast surgical experience and a large store of medical knowledge. The very limited number of the dental profession who will undertake the special surgery of the mouth and associate parts will find that the greater portion of this book is devoted to that subject, and except some peculiarity of diction is clearly and practically expounded. The practitioner of dental surgery to-day, however, does not perform tracheotomy or intubation ; ablation of the tongue or amputation of the uvula. He does not operate for removal of nasal polypi or for epithelioma of the face. The average dentist does not trephine the cranium. The pathology and nature of these conditions as well as their treatment, should be known to the dentist, together with all other morbid conditions to which the body is subject. But such teaching exceeds the limitations of a work on dental surgery, and is as much out of place as in a text-book of ophthalmology. It contemplates also an invasion of the field of more than one other medical specialist, which would involve a question of ethics.

The lesser part of the book is devoted to a consideration of what is known as operative and prosthetic dentistry. The anatomy and physiology of the hard and soft tissues of the head (except the teeth themselves), are concisely described and fairly well illustrated in the first 110 pages. It is singular that one who avows himself a medical specialist, writing for medical specialists, should not refer

students to the standard works on anatomy, instead of endeavoring to embrace so wide a field within the covers of one book.

The description of the teeth, their anatomy, microscopical and chemical composition, is discussed in ten pages. The information given is meager and incomplete for the needs of an oral surgeon. It is also conspicuous that so important a structure as the peridental membrane is dismissed with a pittance of six lines.\*

The description of procedures of operative dentistry, as well as the instruments recommended, reads for the most part like a book written two decades ago. Old-fashioned methods and obsolete appliances have minute explanation, while the modern and improved means are merely mentioned. The student will hardly find the instructions for any of the ordinary filling operations sufficiently explicit. Neither can all the teaching be called sound. Cotton and gold conjoined is suggested, for instance, as a canal filling. Also among the indications for extraction are mentioned many conditions which would not warrant it. The paragraph on setting diamonds in the faces of teeth is in questionable taste.

The purely surgical subjects of fractures, diseases of the antrum, operations for neuralgia, maxillary exsections, etc., which rightly belong in the province of the dentist are well handled, and in a manner which makes the book indispensable. It is a repository of information gathered in a large clinical experience, forming an invaluable addition to the literature of the profession.

ESSENTIALS OF ANATOMY AND MANUAL OF PRACTICAL DISSECTION, together with the Anatomy of the Viscera, prepared especially for students of medicine, by Charles B. Nancrede, M. D., Philadelphia. W. B. Saunders, 1890.

This is a handy memorizer of anatomical facts with excellent plates and cuts, the latter reproduced after Gray, to be used in the dissecting room or to refresh the memory. It is not to take the place of the larger works for medical students, but can be adopted by dental classes with great benefit and time-saving. The arrangement of the cuts of the separate bones all together at the back of the book is particularly convenient, as is the descriptive text concise.

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\* We are assured that a dental anatomy now in press will meet the requirements of authors and students alike.

## PAMPHLETS RECEIVED.

RETROSPECT AND PROSPECT.—Address delivered before the American Academy of Dental Science, at their twenty-second annual meeting held in Boston, November 13, 1889, by John T. Codman, D. M. D., of Boston. Published by the academy 1890.

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## PRACTICAL NOTES.

## A NEW MATERIAL FOR POLISHING STRIPS.

BY LOUIS OTTOFY, D. D. S.

Almost every conceivable material has been suggested for the manufacture of strips for polishing fillings or the approximal surfaces of the teeth. I have found a very suitable material for this purpose in the tracing-cloth used by architects. The cloth is extremely tough, very thin (thinner than anything I know to be used for polishing fillings), pliable, and retains these qualities when moist. The tracing-cloth can be procured of any dealer in art materials, or architects' supplies, and of some of the more extensive stationery dealers. It comes in widths of 36 inches and more, and is sold by the yard. The cost for the 36-inch width is 50 cents per yard. Try it.

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## MEMORANDA.

Dr. B. L. Rhein has gone to Berlin for a prolonged residence.  
 Dr. J. D. Patterson paid a flying visit to Chicago in September.  
 Dr. S. T. Kirk, of Kokomo, Ind., was a recent visitor to Chicago.  
 International Medical Congress, 1893, will convene at Rome, Italy.  
 Southern Illinois Dental Society meets at Chester, Ill., October 21.  
 The Northern Illinois Dental Society is now in session at Rockford.  
 Zinc Sulphite is the newest antiseptic non-irritant and non-poisonous.  
 Ohio State Dental Society will meet Tuesday, October 28-30, at Columbus, Ohio.

Dr. Thomas Fillebrown paid us a flying visit on his way from the far West recently.

Dr. G. W. Sparrock of Point a Pitre, Guadeloupe, W. I., has removed to Lima, Peru, S. A.

From various sources we hear general expressions of delight at the thought of the great meeting of "93."



Dr. W. J. Brady, formerly of Minneapolis, has become an instructor in the Chicago College of Dental Surgery.

The Central and Western Illinois Dental Societies hold their union meeting at Galesburg, having commenced yesterday.

The new dental law of Italy requires that a dental student should be a Bachelor of Arts and a Doctor of Medicine before he can become a dentist.

Dental college stock (on paper) is on the decline, latest telegrams from Springfield, indicate that few or no licenses will be issued during the winter.

The *Medical Record* says that there are nearly two hundred dentists in Philadelphia who are practicing illegally and that the county dental society is prosecuting them.

Unless some one in Illinois will soon apply for papers of incorporation of another dental college, the State of Tennessee will get ahead of Illinois, it already has four dental colleges.

It has been discovered that lawn tennis has its dangers. Cases sometimes occur of unequal development, with lateral spinal curvature, owing to excessive use of one arm. Lawn tennis players, beware!

Dr. W. C. Barrett invited a number of friends to meet Prof. Dr. W. D. Miller, of Berlin, at No. 208 Franklin Street, Buffalo, N. Y., on Thursday evening, October 2, and the dentists of Buffalo entertained Dr. Miller at dinner at "The Iroquois."

Dr. Barrett on his return from Europe was poetically welcomed to Buffalo by the Society of Natural Science. Occasions of this kind make one wish to be away from home once in a while to be so cordially greeted on one's return to daily duties.

The fifth annual meeting of the Southern Illinois Dental Society will be held at Chester, Ill., on October 21, 22 and 23. The Executive Committee has prepared an interesting programme, consisting of essays and clinics. There should be a good attendance at this meeting of the Southern Society, and we hope all who can will attend.

A Philadelphian, just from Asbury Park, tells the latest anti-prohibition dodge. An individual entered a drug store and presented an order for a pint of whisky, signed with his own name and the letters M. D. "You're no doctor," said the drug clerk. "No. I didn't say I was." "Well, what does M. D. mean?" asked the clerk. To whom replied the individual briskly: "It means mighty dry!"

Whoever uses peroxide of hydrogen in pound bottles finds that after one-half or two-thirds is used the remainder will have deteriorated to such an extent as to be useless for treatment of pulpless teeth and abscesses. Let it now be kept to be mixed with pumice-stone for cleaning teeth with engine points. The acid reaction which has taken place, together with the traces of oxygen remaining, make it excellent for this purpose.

A "professor" in a dental college not a thousand miles from Chicago, has the following advertisement in a newspaper: "—— A. B., D. D. S., dental parlors and medical parlors. Dr. —— is a graduate of the —— college of Dental Surgery, class of —— has had over forty years' experience and is pre-

pared to perform all operations in dentistry in a correct and satisfactory manner. Teeth inserted without plates; gold crowns and bridge work. Teeth extracted by new process."

Experiments are being made in Germany as to the possibility of making use in medical treatment of the fact that bacteria and bacilli absorb aniline, and are killed by it. The diffusibility and harmlessness of violet aniline dyes were first demonstrated on rabbits and guinea-pigs, and then human subjects were operated upon. Good results were obtained in each case, and it is believed that, in general, wounds and sores developing suppuration may be sterilized with aniline.—*Medical Exchange.*

Dr. Frances Dowling declared in a paper read before the Cincinnati Academy of Medicine, that at least one person in three between the ages of ten and forty years was subject to partial deafness. The great majority of cases of deafness were hereditary and due to the too close consanguinity of the parents. Deafness was more prevalent among men than among women, because the former were more exposed to the vicissitudes of climate. He thought that telephones tended to bring on deafness when one ear was used to the exclusion of the other.—*Medical Exchange.*

A correspondent of the *Dental Register* (Dr. Sattler, a medical man,) has the following anent International Congresses: In following the proceedings and addresses of the Congress, in the midst of this great concourse of men, the fact that these international medical meetings were fast becoming unwieldy and unmanageable could not but impress itself on me. It seems that in some future time ways and means must be found to obviate this difficulty. *The only solution I can see is in International Sectional Congresses, i. e., an international Congress for internal medicine and pathology, for surgery, otology, laryngology and rhinology, etc. Gradually coming to it, n'est-ce pas?*

Science is beginning to discover the mode in which micro-organisms produce disease. The first steps toward solving this problem were taken by Roux and Yersin, and their experiments have been confirmed and extended by Brieger and C. Frankel, and by Dr. Sidney Martin. The first two sets of experiments were made with Löffler's diphtheritic bacillus, while Dr. Martin used the anthrax bacillus. In cultures of the former it was found that a poison existed which possessed the same properties when injected into animals as the pure culture itself. Brieger and Frankel separated the poison and learned many facts about it. Dr. Martin made similar discoveries with respect to the poison of anthrax.—*Medical Exchange.*

Dr. G. W. Williams, Richmond, Ind., sends us the following clipping:

#### WASHINGTON'S TOOTH.

Isaac J. Greenwood, of New York, is exhibiting a tooth in a glass case. The tooth is mounted in gold. Above it hangs this extract from Mr. Greenwood's father's will: "I give and bequeath to my eldest son, Isaac John Greenwood, forever, all the curios, medallions, snuff-boxes, General Washington's tooth and the under false jaw of teeth made for him by my late father, John Greenwood." The tooth, a large sized molar, yellow from use and age, was the last one removed from the illustrious Washington's under jaw, according to the diary of Mr. Green-

wood's father. In another glass case Mr. Greenwood exhibits a letter from General Washington, recording the remittance of \$15 for a "false jaw." The letter was dated from Mount Vernon, January 6, 1799.—*St. Louis Republic.*

## CATCHING'S COMPEND OF PRACTICAL DENTISTRY.

If you have not already sent in your name for this work (to be issued) after January 1, 1891, do so at once and encourage the editor. Address him at Atlanta, Georgia.

## AMERICAN ACADEMY OF DENTAL SCIENCE.

The twenty-third annual meeting of the American Academy of Dental Science will be held in Boston, on Wednesday, November, 12, 1890.

The annual address will be delivered by W. W. H. Thackston, M. D., D. D. S., of Farmville, Virginia.

EDWARD N. HARRIS, D. D. S., *Cor. Sec'y.*

2 Park Square, Boston, Mass.

## FREE LIST.

Aconite, asbestos, bees-wax (20 p c), books (over 20 years old), books (printed exclusively in language other than English), books (for the use of colleges or their professors), cotton, cuttle-fish bone, gold beaters' molds and skins, gutta-percha crude, India rubber crude, iodine crude, litmus, cajeput, caraway, cassia and cinnamon oils, scientific apparatus casts for educational institutions, plaster of Paris unground, platina in ingots, bars, sheets and wire, platinum, unmanufactured, spunk, teeth, natural or manufactured.

## GRAND UNION MEETING IN BOSTON.

There will be a grand union meeting held in Boston, Mass., October 28 to 31 inclusive, 1890, participated in by the following societies. New England Dental Society; the several State societies of New England; the American Academy of Dental Science; Harvard Odontological Society; Connecticut Valley Dental Society; Harvard Dental Alumni; Boston Dental College Alumni Association; Boston Society for Dental Improvement, and the Worcester Dental Society. The committees are arranging for a very enthusiastic meeting. A cordial invitation is extended to all reputable members of the profession to attend.

EDGAR O. KINSMAN, D. D. S., *Secretary N. E. D. S.*

15 Brattle Square, Cambridge, Mass.

## AN OLD SET OF TEETH.

Dr. McCoy shows an old set of teeth plowed up in a clearing close to Lower Salem by Charley Weiss. The plate is for a lower jaw and is made of platinum. They were carved out and the weight is two and a quarter ounces. The plate shows rough usage, four of the teeth having apparently been broken off with a heavy blow, and the plate itself fractured. The finding of the plate may possibly lead to the unearthing of one of the mysterious disappearances that were of common occurrence in the early history of the oil development in this section. The platinum alone in the plate is worth \$117. Mr. McCoy will send it to the Philadelphia Dental College and have experts to look the matter up and find out when such plates were made, and if possible, by whom.—*Caldwell (O.) Republican.*

## THE CHICAGO ANÆSTHETIC CLUB.

The above club held its regular monthly meeting at the Sherman House, Tuesday evening, October 7. Prof. Anderson, of Denmark, lectured on hypno-



tism in his native tongue, which was interpreted by one of the members. During the evening several persons were hypnotized, and one in particular showed plainly that he was insensible to various tests applied—among others being the holding of a lighted match to the palm of the hand, insensibility to repeated hard blows from solid objects, etc. There was a large attendance of physicians and dentists. The Drs. Cigrand and Kargau were appointed a committee to analyze the fluid of the Hayes anæsthetic mixture. The meetings will hereafter be held the first Thursday of the month at a place to be selected by the executive committee. After passing a vote of thanks to the DENTAL REVIEW for assistance rendered the club, the meeting adjourned subject to call—notices of which will be mailed in time for the next meeting by Secretary B. J. Cigrand, B. S., D. D. S.

EFFECTS PRODUCED BY THE NEW TARIFF BILL ON THE MOST IMPORTANT ARTICLES  
USED BY DENTISTS.

The first column shows the rates on the articles under the present law and the second column shows the rates on the same articles under the new tariff bill.

In cases where both rates are ad valorem or specific the difference is readily seen, but where one is specific and the other ad valorem the dealer can calculate the amount of the change from the market value of the article. The letters "p. c." signify "per cent ad valorem," and the rates expressed in dollars and cents signify that that is the new duty per pound when ton or gallon or other standard of quantity is not expressed.

	Old rate.	New rate.
Chalk, prepared, precipitated, etc...	20 p c	1 c
Chloroform.....	50 c	25 c
Sulphuric ether.....	50 c	40 c
Resublimed iodine.....	40 c	30 c
Iodoform.....	\$2.00	\$1.50
Oil of peppermint.....	25 p c	80 c
Plaster of Paris ground.....	20 p c	\$1.00
"    "    "    calcined.....	20 p c	\$1.75
Aluminum, crude and alloys, free.....		15 p c
Manufactures of gutta-perch and vulcanized rubber	30 p c	35 p c

ODONTOLOGISTS' HANDSOME DINNER AT THE UNIVERSITY CLUB IN HONOR OF  
DR. W. D. MILLER, OF DERLIN.

The Odontological Society of Cincinnati had the pleasure last evening of entertaining Dr. W. D. Miller, of Berlin, one of the many members of the dental profession who have made the United States so justly celebrated abroad as the alma mater of the new-born science. Like many foremost men in the various walks of professional and political life, Dr. Miller is an Ohio man, born and bred. He is the only American holding a professorship in a German University, namely, the University of Berlin. His researches into the causes of dental caries, demonstrated by exhaustive experiments, have made him an authority upon the germ theory of the etiology of Dental caries.

The University Club threw open its doors with cordial welcome, Bruno Bolz, the steward, presenting the following substantials, with suitable floral decorations.

[Chat. Yquem, 1889.] Blue Points. Consommé clair au fromage. [Chat. Mouton Rothschild.] Soft shell crabs, sauce Tarter. Cucumbers. Pattee Montglas. [Pommery Sec.] Filet cheron. Cauliflowers au gratin. [Cigarettes.] Punch Maraschino. Golden plover on toast. Lettuce salad. Omelette soufflee. [Chambertin.] Fromage varies. [Liqueurs and cigars.] Café noir.

Among those present to do the honors of the evening were Dr. F. A. Hunter, President; committee—Dr. C. M. Wright, Dr. O. N. Heise, Dr. W. M. Williams, Dr. J. R. Callahan, Dr. J. Taft, Dr. J. S. Cassidy, Dr. E. G. Betty, Dr. M. H. Fletcher, Dr. A. G. Rose, Dr. H. A. Smith, Dr. F. W. Sage, Dr. J. I. Taylor, Dr. G. Mollynaux, Dr. H. C. Matlack, Dr. R. E. Taylor, Dr. F. Brunning, Dr. C. H. Martin, Dr. Sedgwick, Dr. R. J. Porre, Dr. W. A. Bettman, Dr. J. G. Cameron, Dr. D. W. Roudebush, Dr. H. T. Smith, Dr. J. Leslie.

After the customary toasts had been proposed and answered, all bade the guest God-speed and good-bye. — *Cincinnati Commercial*.

Dr. Miller was also entertained at a dinner by Dr. W. C. Barrett, of Buffalo, New York, Thursday evening, October 2. Distance alone prevented many more friends of the host and guest from being present.

#### A BLOW AT THE BAGPIPE.

A dentist, it seems, has discovered  
That those on a bagpipe who play,  
Run a very great risk of promoting  
A premature dental decay :  
Nay, the mouthpiece so scrapes the enamel,  
And injures the structure beneath,  
That he states that continuous piping  
Is terribly bad for the teeth !

'Tis well ; that the piper should suffer  
Is nothing but fair, I am sure ;  
But what of the innocent victim  
Who has to his piping endure ?  
'Tis surely high time that some doctor  
Should answer this question most grim,  
And tell us respecting the victim,  
The effects that the pipes have on *him*.

—*Exchange*.

#### THE BUFFALO SOCIETY OF NATURAL SCIENCES. TO ITS PATRONS AND FRIENDS.

Come feast at our banquet, partake of our viands ;  
Our tables are free, all are welcome to-night ;  
Though little we offer from Stafford's or Weyand's,  
We lead you to springs of parennial delight.

Our halls are illumined by electrical glances  
Reflected from prisms of the magical isles ;  
Our menu the heart of the student entrances,  
Bacchantes amazes, her lover beguiles.

Our courses are such as Fortuna might covet,  
For Cosmos shall furnish our table's supplies,  
The land and the sea, and the azure above it  
Surrender their dainties your taste to surprise.

Our flowers were gathered and culled by the sages,  
By Pliny, Linnæus, Lamarck, Cuvier,  
By Clinton and others who blazon the ages,  
From old Cincinnatus to President Day.

Come, friends, to our banquet and heartily share it,  
We'll make it a memorable festival scene,  
And welcome with toast the return of our Barrett,  
Director-in chief of our famous Cuisine.

SOUVENIR, Sept. 26, '90.



# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, NOVEMBER 15, 1890.

No. 11.

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## ORIGINAL COMMUNICATIONS.

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### THE STUDY OF COMPARATIVE ANATOMY, AND ITS VALUE TO DENTISTS.\*

BY A. H. THOMPSON, D. D. S., TOPEKA, KAN.

It is universally conceded by students in all branches of learning, that the comparative method in any study is the only scientific method. It is not enough that one branch be studied alone and exclusively, be that study and investigation ever so minute and thorough; for although thoroughness and minuteness will make depth of learning, it is not enough. There must be breadth of knowledge as well as depth, and to insure breadth, a given branch must be compared with collateral branches. Exclusive attention to one thing will make a deep student, but a narrow mind. It requires frequent excursions into other fields to gather material for the illumination of one's special branch, to make the broad and cultured mind. Specialists and special branches are necessary, of course, and exclusive devotion of the mind to one field is required to bring out all that can be known on even one branch—for human time and strength are limited and one mind cannot grasp all knowledge; but that devotion does not exclude everything else, but rather includes a knowledge of those collateral branches which serve to illuminate the special field, for its better understanding.

Especially is this true in regard to the study of man since he has come to be scientifically studied as an animal, in his relations to the rest of the animal kingdom. Before this era, when man abrogated to himself a sort of divine superiority over the rest of

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\*Read before the Minnesota State Dental Association, July 10, 1890.

nature, he would not submit his royal person to comparison with those of other animals. Now, however, as Dr. Holmes has it, "man is studied as the rocks and stars," and the scalpel, the test-tube and the microscope are applied to him as to other objects in nature, which are to be studied and investigated.

Therefore the comparative method in the study of man is now recognized as the only scientific method, and is the only one generally pursued. Not only are his anatomy and physiology illuminated and better understood by comparison with that of other animals, but even his psychology is now being subjected to this method. The old systems of psychology, like the old systems of biology, will probably go to the wall, and many idols will fall before the irreverent sweep of the comparative method; but it will bring us nearer a correct understanding of the mind and its faculties.

Prof. Joseph Le Conte ("Evolution and Religious Thought") says: "There are two widely distinct views concerning the relation of man to Nature; the one as old as the history of human thought, the other only now urged upon us by modern science. According to the one, man is the counterpart and equivalent of Nature; he alone has, in fact is, an immortal spirit, and therefore belongs to a world of his own. According to the other, man is but a part, a very insignificant part, of Nature, and connected in the closest way with all other parts, especially with the animal kingdom. He has no world of his own, nor even kingdom of his own; he belongs to the animal kingdom. In that kingdom he has no department of his own; he is a vertebrate. In the department of vertebrates he has no privileged class of his own; he is a mammal. In the class of mammals he has no titled order of his own, he is a primate, and shares his primacy with the apes. It is doubtful if he may enjoy the privacy of a family of his own—the *Homidæ*—for the structural differences between him and the anthropoid apes are probably not so great as between, for instance, the sheep family and the deer family.

"Now, it is evident that these two standpoints are only views from different points, the psychical and structural. From the psychical point of view it is simply impossible to exaggerate the vastness of the gap that separates man from even the highest mammals. From the structural point of view, on the contrary, it is impossible to exaggerate the closeness of the connection. Man's body is identified with all Nature in its chemical constituents, with the bodies of

all animals in its functions, with all vertebrates, especially mammals, in its structure. Bone for bone, muscle for muscle, ganglion for ganglion, almost nerve-fiber for nerve-fiber, his body corresponds with that of the higher mammals. Whether he is derived from lower animals or not, certain it is that his structure, even in its minutest details, is precisely such as it would be if he were thus derived by successive slight modifications.

"Now of these two views the latter has been in recent times enormously productive in increasing our knowledge. Anatomy has become truly scientific only through comparative anatomy; physiology through comparative physiology; embryology through comparative embryology. Sociology is fast following in the same line, and becoming scientific through comparative sociology. Is not the same true also of psychology? Will not psychology become truly scientific only through comparative psychology, i. e., by the study of the mind of man in relation to the mental life of lower animal?"

But it is to the study of comparative anatomy especially, and its methods, that we wish now to direct attention. This study is attractive and fascinating to those to whom, like specialists in other fields, it elects to open its doors. It is not necessary to defend its beauties now, but rather to point out its value and utility in the study of man, and especially regarding the illumination it bestows upon our knowledge of the jaws and teeth. In this field it has not been utilized as it should be and the especial plea of this paper is for the comparative study of the teeth in our colleges, and that it may receive more attention than it has heretofore. This study will clear up many obscure points in the forms and structure of the teeth of man, and give the student a far better understanding of the principles which govern their evolution and organization. It will, in fact, make odontology scientific.

And first as regards the great principles. The leading principles of comparative study are, the Analogy and Homology of parts and organs. As Prof. Le Conte says (*op. cit.*): "In biology those organs or parts in different animals are said to be analogous which, however different their origin, have a general similarity of form and especially of function; while those are called homologous which, however different their general appearance and however different their function, yet may be shown to be modifications of originally the same part, but altered for different purposes. The analogous



parts when compared look and behave as if they were the same, yet are not ; and the homologous parts look and behave very differently but are, in fact, the same part in disguise. For example, the wing of a bird and the wing of a butterfly are analogous organs and have the same function—flying. But they are not homologous, for they are not the same organ or part and have certainly never been formed out of the same original organ by modification. But the wing of a bird, the forepaw of a reptile or mammal, the wing of a bat, the arm and hand of man, though so different in form and function, are homologous parts. On close examination they are found to have the same general structure, to be composed of essentially the same pieces, although so greatly modified in order to adapt them to different functions that the general resemblance is lost. They are homologous but not analogous parts. Their structure is precisely such as it would be if they had all originated from some archetype fore limb by modification for different purposes. Again, the lungs of a mammal and the gills of a fish are analogous organs, since they have the same function of aeration of the blood. But they are not homologous, they are not built with the same plan, nor could one be derived from the other. But there is an organ in the fish which is homologous with the mammalian lung—the air bladder—which is used by fishes only for flotation. This organ is the beginning of lungs, which by gradual steps is developed into the lungs of the higher, air breathing animals.” These examples might be multiplied to the extent of all the organs and tissues of the body, but we see clearly that “analogy has reference to general resemblance of form determined by similarity of function, however different the origin of the parts may be. Homology has reference to community of origin, however obscure the path of evolution may be and however diverse may be the organs and their functions now. Common origin completely explains homology by comparison, and by the study of embryology and the comparative method is therefore the scientific method.”

It is by homology of structure, not by superficial appearances, that the whole animal kingdom is divided and classified. All animals are grouped in relation to their plan of structure. There are first the two great divisions of the animal kingdom into vertebrates and invertebrates. The first has a backbone or vertebral column, the other has no backbone, but most of them have the body divided into segments or joints. The general structure in each

class is governed and the organs are arranged according to the primary plan. These sub-kingdoms are then divided and subdivided until division can be carried no further when it reaches species; each division depending on peculiarities of structure and classification depending upon homologies.

Restricting ourselves to the vertebrates, there is to be noticed as a special example of homology, that of the limbs. Compare the fore limb of man with that of the cat, dog, sheep, horse, bat, bird, turtle, frog, mole, whale, or fish — and what a variety of function is represented, but throughout the series there is homology of the whole and harmony of structure for there is a similar origin of each one and similar embryology and development. The law of differentiation comes in in the development and specialization of forms, by which the law of adaptation to new functions operates to account for the new direction given to development, by which parts are modified and changed. So in regard to the limbs of vertebrates, new functions led to differentiation of structure while the general plan remained the same. This law of differentiation is the fundamental law of evolution. It first causes the divergencies that take place in the process of the evolution of the cells forming the embryo, by which the typical destiny of the individual is indicated. The cells diverge again to form different tissues and those to form different organs to perform different functions. So in the formation of the limbs, the different cast was given to each one as the ruling type indicated, at a certain stage in the development of the individual, and the law operates also in regard to the evolution of all other limbs and organs.

The development of the mammalian head is of especial interest to us as dentists, and more particularly the face, jaws and teeth. The brain case has been modified wonderfully, from the lowest to the highest vertebrates, to accommodate the growing brain, until in man it towers over the face, and the jaws become reduced to a more or less rudimentary condition as compared with other animals. The face has some curious analogues in the animal series, especially when comparing its structures as evolved for the accommodation of the sense organs with the sense organs in other forms. For instance, in the vertebrates the sense organs have a definite position in the head and a definite relation to the brain, so that in the mammalia the face and sense organs are analogous and homo-

logous. As compared with lower forms, however, it is a mooted question as to what the jaws really are and what are their homologies. It is known that the jaws are developed from the two upper segments or rings of gill-clefts of fishes and amphibians, but it is not settled whether they are homologous with the limbs or not. They are appendicular structures like the limbs and are, like them, suspended from the vertebral skeleton, but are probably not homologous. It is well known from the developing embryo where the upper pairs of gill-clefts unite to form the upper and lower jaws, but their homology is obscure.

Throughout the vertebral series, from the fishes and amphibians up through the reptiles, birds and mammals to man, the jaws are homologous and analogous and from origin to function pursue strict relationship and resemblance. They vary somewhat as regards the extra functions performed by them in different animals, but the main purpose is preserved in all. In the herbivorous mammals, for instance, there is extensive masticating area and a loose moveable joint to allow of free movement of the lower jaw, or mandible, in every direction, for the minute comminution of coarse vegetable food. In the carnivora there is simple vertical movement for the seizing and cutting of flesh, but without lateral movement of the jaws, as the flesh food does not require mastication. In the rodents there is extensive vertical movement to allow of cutting with the strong incisors, and considerable lateral motion to permit of mastication. In the more omnivorous forms there is a combination of these movements without the extremes, and in all forms there is an adaptation of means to ends. The study of the mechanism of the jaws in lower forms, their origin, development and function, comparing them step by step with those of man, would throw much light on many questions. For instance, much interesting information regarding and elucidation of the vexing problem of the causes of irregularities of the teeth, could be acquired by the extensive study of the jaws in lower forms and even in the lower races of man, as compared with the higher races. Many resemblances could be worked out which would account for erratic forms of the jaws in man, which we now consider to be abnormal freaks, might only be reversals to former types.

In the field of the study of the teeth, odontography, in relation to and in comparison with those of lower animals, there is a mass of interesting material to be gathered. Every one knows that the



teeth in man are more or less rudimentary as compared with other forms, and it is only by comparison with those forms that a proper understanding of them can be attained. The developmental history of a tooth is as interesting as that of a species. The light that is thrown upon our special field by such investigation, is very great, and if we would pursue it would help us to understand many things which are now regarded with childish wonder as mere curiosities or abnormalities, but which are really subject to simple laws, if we would but study and understand them. We are far behind the science of the age in our methods of studying the teeth, and in the quantity and quality of the knowledge of the subject which we know and teach. The mass of the profession know little of comparative anatomy or of its value in our field; and so far as the young men are concerned, the fault lies with the instructors and the system in the colleges. Accounts often appear in the journals of anomalies in the possession of correspondents, which are described as being very wonderful and unique, but which the student of comparative anatomy knows are merely reversals. For instance, a three-rooted upper bicuspid is a reversal to the anthropoid type, as the apes have that form, their premolars being implanted with three roots. Or again, an additional incisor, a double, it may be, is reported, which is also a reversal (the original number of incisors being six, two having been suppressed), or one or both laterals may be suppressed entirely, and for several generations in a family. This the student knows is because the lateral incisor is becoming erratic, like the wisdom tooth, in less degree, and like it, is starting on the road to disappearance. The wisdom-tooth is quite often absent in civilized man, because, as is well known, it is on the high road to total suppression in the species, although it is as good and as well set in the lower races of man and the higher apes, as the other molars.

This suggests the subject of additional or extra teeth in the human series, "supernumerary teeth," as they are called. These are usually considered to be freaks and accidents; but the evolutionist knows that they are produced by the workings of the law of atavism, i. e., the reappearance of organs or parts that have, in the course of development, been aborted. Man has lost twelve teeth, i. e., the difference between thirty-two and forty-four, the normal, typical mammalian number, and supernumerary teeth are the representatives of the number that have been suppressed. Nature, in

response to some unknown impulse, makes a spasmodic effort, a spurt of hereditary energy, and reproduces the original dental germs. Additional molars, bicuspid, or incisors, which were the last teeth to disappear from the species, are usually the teeth to reappear. They are of course, mostly deformed and rudimentary, as the effort to produce teeth of full form is too much for the failing powers. Occasionally a fully formed supernumerary tooth is produced, but the instances are rare.

There are occasional resemblances to lower forms which crop out in individual teeth that are highly interesting, and but for the light thrown upon these eccentricities by comparative study, would be considered as mere anomalies and freaks. For instance, the tri-cuspid upper molar, as sometimes seen, especially in the Latin races of man in Europe, is a distinctly Lemurine character, as pointed out by Prof. E. D. Cope some time since. The special connection between the Lemurs and these races is only collateral, of course, and is as unknown as the paleontological history of man itself. But the knowledge of the Lemurine dental characteristics points out that the peculiarity is a reversion, according to the law of atavism, and that a scientific reason can be given to account for it. Or again, the wrinkled face of the lower wisdom tooth which appears in some persons, is a reappearance of the orang type, which has such molars. Or this tooth may be tri-cuspid as in the Macaques. Again the vertical grooves on the face, and the notches on the edges of the incisors, which are so conspicuous in childhood when the incisors are first erupted, are rudiments of a permanent condition in some lower animals. The *Galeopithecus* monkey has the lower incisors divided into teeth like a comb, and many of the carnivora have the teeth deeply notched. In man the grooves and notches, which soon wear away, are suggestions indicating collateral inheritance, which in other forms is carried further and becomes permanent. Again, the canines are much reduced in size in man but still retain the backward curve that recalls the saber shape so conspicuous in the long trenchant canines of the carnivorous animals, and more or less so in the quadrumana. There is also a large diastema found in the apes and most monkeys, and before them in the carnivora, in front of the upper canine, between it and the lateral incisor, which the long lower canine enters when the lower jaw is closed. This diastema is sometimes found in the lower races of man, and very rarely there is a space between the upper

canine and lateral incisors in civilized man, in well formed jaws, (when it is not due to disease) which must be considered a survival. Again, the cusps of the grinding teeth of the insectivora are usually long and sharp for the crushing of the chitinous armor of insects. This peculiarity sometimes reappears in the extra long molar cusps of man; especially of the postero-lingual cusp of the upper molars, which is often troublesome in articulating. The reappearance of extra cusps and cingulums on the human molars might, perhaps, be traced to the same source, as the molars of the Insectivora, *Tomes* says, "fairly bristle with cusps." Again, the New World monkeys have 36 teeth in very nearly all species, while the Old World quadrumana nearly all have the human formula, 32, man being descended as a collateral branch with them. The higher apes have the human formula exactly, and also have the oblique ridge so characteristic of the human upper molars. This ridge is not found in the lower quadrumana and seems to have been a later appearance.

Many other features in the teeth of man and their environments have been noticed which are explained by comparison with lower forms, and many more can be explained by further study and comparison. In fact, nearly all forms and features of the teeth, as of other organs, being inherited, come from previous forms and indicate relationship with them. And thus in our own branch we insist that the value of comparative anatomy cannot be over estimated. It should be given a more prominent place in the curricula of our colleges, and in our text books, that the practitioner may gain a more scientific foundation for the principles that underlie practice. In this age of the world knowledge is of no value whatever if it is not exact to the very minutæ. In former times general knowledge was quite sufficient for the purposes of life, even if it was not very exact as to details; but in our day such general knowledge is not sufficient. Sometimes stupendous consequences depend upon the mastery of a minute detail. No fact is so insignificant as to be valueless, therefore it is worth all the labor that can be bestowed upon it to make it exact. In modern science much depends, we might say everything depends, upon exact knowledge of often apparently insignificant facts; but these, when marshalled in numbers, give birth to great principles which revolutionize thought and affect the destinies of men.



## DENTAL SCIENCE AND LITERATURE.\*

BY DR. THOMAS L. GILMER, CHICAGO.

Your committee on Dental Science and Literature beg leave to present the following as their annual report :

The work has been divided between the three members of the committee, each preparing a part. The chairman wishes to take this opportunity to thank the other members for their cheerful co-operation.

No marked progress has been made either in dental science or literature since the report of 1889. Each has made advancement, but perhaps less rapidly than in some previous years. New books and revised editions of older works have been sufficiently plentiful to indicate increasing sales of dental publications. But the result of some inquiry among the publishers and book-sellers seems to indicate that the numerical increase of the members of the profession is greater than that in the sales of books. We believe the journals are improving, and we are informed that their patronage is steadily on the increase. Among the books, new and revised, appearing since the last report, the following are the more prominent.

Clifford Mitchell has revised and improved his *Dental Chemistry and Metallurgy*. This book cannot be too highly commended. It is one of the Dental College series, and, while written especially for students while attending college, is well adapted to the needs of the practitioner.

The revised editions of Ferdinand J. S. Gorgas' *Dental Medicine* and Chas S. Tomes' *Dental Anatomy*, are to some extent improvements on previous editions. The latter lacks especially in one particular. The description of the forms of the teeth and the shapes of the pulp chambers is wholly inadequate. We believe there is a demand for a better description of the surfaces of the teeth and roots, with accurate cuts detailing the shapes of pulp chambers and root canals. When we have seen, as some of us have, through the work of Dr. Cattell before the Chicago Dental Society, the great variety and abnormalities in the shapes of these chambers and canals, we will realize the importance of additional information on the subject, and recognize as well the cause of so many imperfections in root canal fillings. We are pleased to give you, in connection with this notice, the information

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\* Read before the Illinois State Dental Society.

that there is now a work ready for the press which fully covers this field. This work embraces an explanation of the technical terms used in descriptive anatomy of the human teeth; descriptions of the surfaces and surface markings of each tooth individually; dissections for the examination of, and description of the pulp chambers and root canals of each tooth; a full description of the deciduous teeth; a description of the normal dental arch, or arrangement of the teeth, and their occlusion; a description of the peridental membrane, alveolar process and gums. It will have about 150 original illustrations.

Title, Descriptive Anatomy of the Human Teeth. Author, G. V. Black, M. D., D. D. S., Illinois.

A second edition of Dr. Geo. Evans' book, Crown and Bridge-Work, has quickly followed the first, it having been exhausted within a year. Note was taken of the first edition by your committee last year. The second edition is enlarged by thirty pages, with an addition of forty-seven cuts. The cuts are clean and the text is clear. Much has been omitted, still it is by far the best we have on the subject, and we believe should be in the possession of every dentist. In connection with this notice, we wish to call your attention to an article by Dr. Curtis, of Syracuse, N. Y., on the Curtis bridge. The article will be found in the February *Cosmos*. In making bridges we often find difficulty in shaping the pier teeth that they may be parallel with each other; sometimes the cutting necessary is so extensive on account of the leaning of the teeth, as to endanger the life of the pulp. Dr. Curtis obviates this extensive cutting by fitting crowns to each of the teeth and soldering to the crowns arms to receive and hold the span between the piers. There are sockets at each end of the span into which, accurately and tightly, fit the arms of the crowns.

The only new book on irregularities during the year is Guilford's work, Orthodontia. It is abreast with any work on the subject. There have been a number of interesting articles in the journals on the same subject by Drs. Talbot, Farrar, Angle and others.

To those who use anæsthetics, we can cheerfully recommend as being an excellent work, the revised 3d edition of Laurence Turnbull's Artificial Anæsthesia. The fact that six months after the 2d edition had been issued, a third was demanded, indicates the appreciation in which it is held by the medical profession. In con-

nection with this notice it may not be amiss to note the report of the committee known as the 2d Hyderabad Commission, appointed to determine the truth of Prof. Syme's statement, that chloroform does not kill, as has generally been supposed, by paralyzation of the heart, but by arresting respiration. The report bears out Prof. Syme, and while radically differing from the prevailing opinion, will be accepted by many as conclusive.

One of the latest productions is Dr. Foster Flagg's *Plastics and Plastic Fillings*. Third edition. This edition is not materially different from previous issues. When Drs. Palmer, Chase and Flagg started the "new departure" some years ago, almost the entire profession were vociferous in their denunciation of it; but there has undoubtedly resulted a wide spread increase in the use of plastic materials, and though we believe they have been put in a vast number of places where gold would be better, there has been enough improvement in knowledge of their qualities and the skillfulness of their use to justify the old adage "there is no great loss without some small gain."

There has of late appeared a new book by G. A. Liebig, Jr., and George H. Rohe, M. D., title, "Practical Electricity in Medicine and Surgery." While this work was not written for the dentist, it is well adapted to his needs; especially those who are interested in electrical applications.

In the German, Dr. W. D. Miller has a new book. Subject, "Die Mikroorganismen der Mundhöhle." From criticisms, we conclude this to be decidedly the most important addition to the literature on this subject during the year. Before long it is expected that a translation will be made and the English-speaking part of the profession will be able to read it in their own language.

Another foreign work which has drawn forth favorable comment is Claude Martin's new book "*De La Prothèse Immédiate Appliquée a La Résection des Maxillaires, Rhinoplastiesum Appareil Prothétique Permanent*," etc., etc.; which treats of the immediate insertion of a permanent appliance following the resection of the maxillæ, which may also support an artificial nose; the manufacture of artificial lips, etc. Whether there is soon to be a translation of this work your committee is not informed.

M. Paul Dubois, has also in the French a new work, "*Aide-Memoire du Chirurgien-Dentiste*"—a ready reference book for the surgeon-dentist. It is a treatise on pathology and therapeutics of



dental caries, operative dentistry, etc. It is said that in this book there have been copied without credit, original designs illustrating two forms of alveolar abscess by one of our members.

There have been no distinctively new works on dental histology, microscopy, pathology or materia medica during the year. Indeed, there is but little to note on these subjects.

The "Elements of Histology," revised and enlarged, by E. Klein, M. D., F. R. S., is a book although not written especially for the dental student has chapters on the teeth, the salivary glands, the mouth, the pharynx and the tongue, which will make it valuable for his use. The cuts are good, especially the micro-photographs. Indeed, the entire work is fully up with the latest advancement in this line of science.

Dr. Abbott read a paper before the American Dental Association. Subject, "The Growth of Enamel." Published in the proceedings of that society.

Dr. Andrews read a paper before the dental section in the American Medical Association, subject, "Pits and Fissures of the Enamel,"—published in the *International Journal*; and Dr. Perrin read a paper before the Harvard Odontological Society, published in the *Archives*, subject, "Development of the Teeth." These papers are all readable. Dr. W. D. Miller has an interesting paper in the December *Cosmos*, title, "On the Antiseptic Action of Filling Materials." In this article the statement is made that unannealed gold possesses seemingly antiseptic qualities but whether the action is strong enough to entitle it to consideration as a saving property, he is not yet ready to answer. Copper amalgam, he finds, possesses the greatest antiseptic properties of any filling material. Tin and gold combined was found not to be so active as unannealed gold alone. He details experiments which seem to bear out these statements. If the article has escaped your attention we would suggest that a perusal of it will repay the trouble.

Your committee would make special mention of the paper by Dr. Betty published in the April REVIEW, detailing "A Critical Examination of the Teeth of Several Races," etc. Dr. Betty had access to the large collection of skulls, several thousand in number, in the Army Medical Museum in Washington. It was some such work, but of a more extended nature, that a former committee of this society was expected to do, and it is one that must be

carried to completion before we can have the data necessary to work many problems in dental science.

In pathology there have been no new discoveries, nor any new theory advanced which has taken shape definite enough to entitle it to a place in this report. Dr. Atkinson in a paper on pus, endeavors to prove what has often been claimed, that pus may be formed by chemical changes within the tissues without the intervention of micro-organisms.

Many of the new remedies brought to notice are relegated to obscurity after their first announcement. Others seem to contain some promise—the chloride of methyl as a local anæsthetic brought out by Dr. Rhein of New York, published in September number of DENTAL REVIEW, sodium silico-fluoride for putrescent pulps and pyorrhœa alveolaris, which had already been noticed by Dr. Harlan, is again the subject of a paper by Dr. Vaughn, recording extended experiments with it—this paper will be found in a late number of the *Cosmos*.

The lengthening of the college terms to three years, is a most important step and one indicating a healthy sentiment in the profession. The present system of dental laws has had the effect to crowd all the students to the colleges, and the natural result begins to show itself in the pressure of the class of students who formerly sought the quack or incompetent preceptors, to find easy-going and quackish colleges, and some competition among certain colleges to obtain that class of students. There will presently arise an urgent need for some outside pressure by the State, to assist the colleges in maintaining a high standard of instruction; a sufficient amount of care to exclude unqualified matriculates, and proper strictures in the qualifications and examinations for graduation. Without attention to these matters, the addition of a year to the required course will accomplish less in the way of progress than is expected of it and ought to be secured by it.

The preparation of text books especially for dental classes, and the demand for a closer and more effectual union of the manual and intellectual in the training of the dental student also point to an advanced sentiment. A suggestion has been thrown out to which it seems the profession should give some attention, looking to an improvement in our charter laws which would prevent the granting of charters to irresponsible or unworthy parties. This surely can be done.

There has been little or nothing developed during the year in the departments of Operative or Prosthetic Dentistry or Orthodontia, that is really new. The subjects that have appeared most to interest the profession have been the various forms of gold or porcelain or enamel inlays, used for filling decayed cavities, and the ever present question of root canal fillings, upon which there ought before long to be a closer agreement and a more satisfactory general practice. In Prosthetic dentistry one of the interesting questions now before the profession is the place likely to be filled by the metal plates deposited by electrolysis, the practicability or otherwise of getting them made conveniently enough for general adoption, and the business methods that will be pursued by the owners of the patents upon the process.

The *International Journal* for July had an article on the stamping of plates in a hydraulic press instead of swaging them, by means of which a die can be used that is so fusible as to be poured into a plaster impression, but too brittle to be struck by a swaging hammer.

The inlay fillings appear to be a very interesting development of operative dentistry. Several of the methods will probably be demonstrated in the clinics, and an extended account here is not necessary. The essentials of the process are the burnishing of platina foil or heavy gold foil (120) to as close adaptation as possible to the walls of the cavity without carrying it into the undercuts so as to prevent easy removal and insertion, the adaptation at the margins being close as possible. The matrix thus formed has gold flowed into it or some easily fusible porcelain or enamel colored as carefully as may be to match the tooth. The surface or contour is dressed nearly as desired, and the inlay fastened in its place by means of phosphate the final finishing done after cement has hardened. Of course the metal surface next the phosphate must be etched, or the bottom made double and perforated in some way to insure strong adhesion of the cement to the inlay. The undercuts of the cavity are filled with the phosphate, of course, and the retention of the plug depends wholly upon the strength and durability of the cement. Some years of time will be required to determine this, and how much strain of mastication upon restored corners the phosphate will stand without breaking.

Dr. W. B. Ames has done some experimental work in the mouth with fillings of gutta-percha into which a considerable portion of



very finely divided precipitated copper has been thoroughly incorporated. He thinks that temporary teeth filled with it are less liable to decay under the fillings than when filled with ordinary gutta-percha. Whether the formation of poisonous salts of copper requires any consideration in this connection or in relation to the use of copper amalgams, this writer is unable to say.

A thorough discussion of root-canal filling would be too long for this report. The problems to be solved in respect to preparation are, to accomplish the nearest that is practicable to a complete removal of all remaining tissue or debris, and perfect antiseptic or aseptic treatment which shall be effective in the canals themselves, in the tissues or space surrounding the apex of the root, and so far as may be possible, throughout the tubuli of the dentine; after which drying as perfectly as possible will complete the preparation. It is in the choice of a material for the filling that the greatest diversity of opinion appears, partly because no material has yet been proposed for the purpose that seems to meet all the requirements perfectly enough to satisfy the desires of all the members of the profession. A satisfactory material should have plasticity sufficient to admit of being carried into canals not much larger than a hair, with a degree of insolubility, freedom from evaporation, and lack of diffusibility that will insure it to stay where it is put and make it tight enough to exclude everything else. It should have such relation to the walls of the canal as to flow or slide over them to the end, by the churning or pressure of the instrument, without sticking and hardening on the walls in such a degree as to clog the canal and obstruct the passage of the material to the end. This is a serious objection to oxychloride and oxyphosphate of zinc, and if either is made thin enough to overcome this difficulty, the subsequent shrinkage by diffusion of the excess of fluid will leave a very porous and inadequate filling. The same difficulty of diffusibility or evaporation and consequent shrinkage attends the use of gutta-percha in chloroform. In connection with all three of these materials it is the custom to use some less plastic material to fill as much of the space as it can be made to occupy, and so reduce to a minimum the amount of shrinkable material. Gold is used for this purpose by a few, and gutta-percha cones without warming by most, and results that are reasonably satisfactory are obtained in this way if done with sufficient care and skill; but in too many instances round cones are used to fill flat roots or so little care is

taken in respect to their size, that if opened afterward, the solid material will be found to extend only one-fourth to one-half the depth of the canal, and the remainder will be practically unfilled—at least that has been the case in rather numerous instances that have come under the notice of the writer—and that, too, in large and easily manipulated roots as well as in small and difficult ones. If gutta-percha and chloroform is used, its adhesion to the canal walls and its movement to the end is greatly facilitated by moistening them with eucalyptol, after first drying them thoroughly as usual, and some operators use it as a solvent for the gutta-percha or Hill's stopping instead of chloroform. After the solution of gutta-percha has been carried to the end of the canal some operators carry in portions of gutta-percha or Hill's stopping softened by heat, and manipulated with a hot instrument instead of using cold ones; by this method it is probable that a larger proportion of the solution can be displaced, and a closer adaptation be made to irregular-shaped canals.

Carbolized cosmoline has been advocated as a canal filling, but it seems likely that its diffusibility will prove even greater than that of the materials already in use, and that it will penetrate and color the dentine so as to prevent its use. It cannot be justly claimed that absolute ideal perfection is usually attained with any of the materials now in use. The very satisfactory success attending the practice of careful operators is due chiefly as respects the materials used, to two or three points in the manipulation. When the filling is carried quite to the apex it is probable that it often clogs the fine foramen (or foramina) permanently, notwithstanding its shrinkage. If the opening of the canal into the pulp chamber is tightly closed it may permanently prevent the access of sepsis from that direction, and lastly, if the material *can* be made to adhere to the walls of the canal so as to leave them covered with a film more or less thick after shrinkage, the results will be better than if all the material shrinks together into the interior of the canal leaving the walls exposed. Is it too much to hope that we may sometime find a material better adapted for root-filling than any now in use? Very great degree of plasticity is essential for successful manipulation, but hardness afterward is not, except as that may be related to insolubility and freedom from diffusibility. If no thicker than cream it would answer, provided it were insoluble, and would not diffuse through the dentine or through the foramen and would not shrink.

The deposited plates seem to be worthy of attention and trial. They are said to be made in three layers ; two outer ones of pure gold, and an inner one of pure silver. In appearance they seem sufficiently strong and rigid. They lack the elasticity of swaged gold plates or rubber plates, but in the case of continuous gum, which is still more rigid, that is not considered a disadvantage. Being deposited directly upon a plaster model, the fit would probably be better than in the case of rubber, which is liable to some shrinkage in vulcanizing. It is claimed for it that additions can be made to plates or broken places mended by the same process, so as to be practically equivalent to soldering. This would make it practicable to add new teeth, or perfectly mend a plate without removing the rubber attachment. In practice it will probably prove necessary that the work be done in laboratories specially fitted up for the purpose, rather than by every dentist for himself ; and the methods which the owners of the patents adopt in dealing with the profession may have much to do with the question of its general or only very limited introduction ; for this is something we *can* do without, unlike the making of crowns and bridges, which we all *must* do. There are several very satisfactory substitutes for the deposited plates which will answer our purpose very well indeed if the owners of these patents are so short-sighted as to subject us to any great amount of extortion or any unnecessary annoyance in their manner of doing business with us.

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#### DESPERATE CASES AND HOW TO TREAT THEM.\*

BY DR. G. W. DENNIS, LA SALLE, ILL.

Is there an earnest, progressive dentist who has not often wished he might be saved the annoyance of failure, resulting from the inability to properly meet and overcome the difficulties arising in certain cases, frequently encountered, not only in the operative, but also in the mechanical departments of our work?

Owing to persistent neglect, caused by a dread of dental operations, as well as for other reasons, we often find existing a state of affairs with which we are unable, by ordinary means, to cope successfully. These we will designate "desperate cases."

Teeth of soft texture, long neglected, badly decayed and broken down, covered, perhaps, with calcareous deposits, present condi-

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\* Read before the Illinois State Dental Society.



tions wherein success is doubtful and only to be attained by delicate and skillful manipulation made with the *greatest care*. It may be contended that the restoration of broken-down teeth and the mounting of the different crowns has become common, every-day work in the offices of the present day, but careful observation would lead us to believe that what may be ordinary routine work for a small percentage of our most skillful operators, is practiced with indifferent success (or not at all) by the larger number. It will not be the object of this paper to enter into the minutæ of special cases, but to outline a few general principles governing certain conditions. It will not be claimed that the methods herein considered are invariably the best, but that they will meet the requirements of a large number of cases where, for want of unusual facilities, and in the absence of fees commensurate to more complicated operations, teeth are often sacrificed.

The natural tendency with many is to shirk the responsibility and perform an operation that will most readily free us from the present difficulty, regardless of remote consequences, and leave us ready to engage in more pleasant and profitable employment. Especially has this become the case since the advent of the oxyphosphate cement, which is often used where it should not be. This will not do for those who desire operations as permanent as possible. In view of its uncertain durability, we do not believe an operator justified in inserting cement, except for temporary work, which is seldom necessary.

It is detrimental to the reputation of an operator, and it is folly to perform hasty and imperfect operations on the plea that the occasion does not warrant an effort, and it is *cowardly* to extract simply because success is doubtful. No wonder people lose faith in the vaunted progress of conservative dentistry under such circumstances.

An intelligent man will not do thus while engaged in building up a reputation. Should we not in *each* case, endeavor to approach as nearly to success as lies in our power? Let us see if after all it is not the desire to dispatch our work easily and profitably—instead of lack of means at hand, that causes most of our failures. Even white teeth of inferior structure with enamel the thickness of writing paper may usually be saved by proper means for many years.

Occasionally we see the work of certain operators that seems to stand in spite of all adverse circumstances and surroundings.

But it is said, "He is a genius, a man of a thousand." Watch him operate, study his methods—you will find that genius simply means labor, thought, attention to details, the leaving of nothing undone that may contribute to success. It is attention to details, that enables him to make his operations durable—to save 99 per cent of pulpless teeth, and *occasionally* to preserve alive and in comfort an *exposed* pulp. The detail man does nothing hastily, (though he is not necessarily tedious) and his failures are therefore few. The proper preparation of the cavity, the judicious selection and *correct* insertion of filling materials will almost invariably bring success. The co-operation of the patient is a most valuable aid and should if possible be secured.

Certain rules must be followed in the ground work of preparation, and should be varied to meet the case in hand. In the six anterior teeth, care should be taken to dress back frail walls—*especially* upon the lingual surface; so as to afford all possible protection. This important fact is too often disregarded, as is proven daily by cases coming under our observation. Suppose two operators of equal manual dexterity—one of whom habitually disregarded this rule, but obtained access by cutting away the strong labial enamel plate, the other using this wall to retain the filling and gaining access from the lingual surface, cutting as freely as circumstances dictated, what would be the relative ratio of their failure or success? Frail corners should be removed and, if necessary entire cutting edges restored. Even a "jewelry" filling is preferable to an artificial tooth whether sustained by root, bridge, or plate.

For example, let us quote an actual case in practice. The tooth—a left central incisor—was so badly decayed from the distal surface that the alveolar process was reached. A large portion of the lingual and somewhat less of the labial walls gone, and the remaining portions but little stronger than an egg-shell, though the cutting edge remained intact, and the cavity partly filled with hypertrophied gum tissue; this being excised, the canal cleansed, treated and filled, the cavity was prepared and lined with oxyphosphate, and a contour amalgam filling inserted. After a few days this was well polished, the dam adjusted, and the visible portion of the amalgam cut out to form a shallow cavity, and faced with gold. Was not this likely to prove more durable than a crown? A strong

post inserted in the root canal will often be needed to help retain such fillings.

In preparing frail cavities in bicuspid and molars, the lateral walls should be cut back enough to be out of reach of particles of food that may be allowed to remain between the teeth. Some writers object to cutting between teeth on the ground that they are likely to be overburdened with filling materials and be unable to bear the strain of leverage exerted in mastication. This fear is groundless where the grinding surface is well cut back and properly protected by fillings of sufficient thickness. Experience teaches that even slight undercuts or bearings against cavity walls will retain fillings safely, if only such walls are themselves protected from fracture. The cervical margin of the filling should be carried below the gum line, and restoration to *full contour* made in all proximal fillings, and finally, all surfaces well polished.

While recognizing the value of gold, and especially soft gold at *vulnerable* points, we hope by using other materials to gain advantages not possessed by it alone. Gold and amalgam, or amalgam alone, have their respective merits; the oxidation which is almost immediately commenced around such fillings tends to stop any minute crannies existing upon completion of the work. Gold fillings with a layer of amalgam at the cervical margin are, I believe, the best possible protection for teeth of the class now under consideration; but here again we must attend closely to details or fail. A matrix is necessary, and should be narrow—but little wider than sufficient to cover the meeting place of the two materials. Having cavity ready, matrix firmly fixed in place, and instruments selected, prepare the amalgam quite dry. Place a small quantity against the cervical margin and burnish well, then another small piece *lightly* packed upon the first, as gold does not readily unite with a burnished surface. Now quickly condense a piece of Williams' crystalloid gold upon the amalgam until the gold color is lost, and and follow with more until the mercury ceases to show, when the filling can be finished with any form of gold desired; but *don't* smear the amalgam over the matrix or into the cavity, or your filling is spoiled.

In packing amalgam, a well-fitting and immovably fixed matrix should be used, the material packed with strong rotary motion or with the mallet, and matrix left in place until the filling is fairly hard, and if properly mixed and manipulated this will be but a



few minutes. If desirable, the matrix may be removed at once by slipping out sidewise, and a piece of medium dam, which has been slightly moistened, inserted between the teeth, be held for some moments with steady pressure, against the filling, to finish. Those who have not tried this will be surprised to see how neatly a filling is shaped up, the edges made smooth, and the whole perceptibly condensed. Face fillings of amalgam are to be avoided, but when necessary copper amalgam is probably safest. It possesses the merit of being retained by more shallow undercuts than any other permanent filling, and for buccal cavities stands unrivaled.

I will venture the assertion that if cavities are properly prepared, fillings packed and finished as they should be, decay will seldom recur. If we do our whole duty and are really skillful, teeth operated upon should be in far better condition to resist decay, than before they were first attacked. It is impossible to fix a given time for the durability of any filling, but, aside from certain phases of disease or of accidents, I believe that if a filling fails within the space of six years the fault lies usually with the operator. For posterior teeth, needing entire restoration, permanent gold matrices or bands, filled with amalgam, are of great value. In this work, I cut or crowd the gum tissue back, dress the root as desired, make a close fitting band, varnish both sides to prevent the mercury discoloring, force it firmly upon the root, dry, and if any minute crevices exist for ingress of moisture, stop them with a small amount of gutta-percha, then adjust the dam as on any tooth and prepare the root canal and insert a post.

The amalgam may be packed to restore cusps, and should be nicely finished at another sitting. Or, amalgam or cement may be used for most of the filling and the cusps restored with gold foil. This would seem better than an ordinary gold crown, in that the work can be seen in every stage, and an imperishable joint is formed between root and band.

For securing the measure of roots an instrument can be used shaped like a pair of small pliers, the point of each half being split and having a ring upon it, forming a miniature clamp. A piece of tagger's tin is cut about the desired length, and wide enough to rise a trifle above the end of the root. The jaws of the pliers are clamped upon this, and by compressing the handles the tin is drawn around the root and the measure quickly and accurately obtained. Gold crowns are too well understood to need more than

passing notice. My own preference in constructing them is, on the score of strength and simplicity, to *cast* the cusps, then fit and solder the band. For the anterior teeth, there is no all porcelain crowns not open to serious objection. Probably a few years hence dentists will be wondering at the blindness that allowed them to mount Logan, or any other porcelain crown with cement; especially with an entirely unprotected joint between root and crown. Many valuable roots are thus each year being put in a way to be lost. Amalgam is undoubtedly (in a general sense) the best material now in use for mounting crowns. The discoloration at the gum line being the principal objection, but this can be obviated by using a band, and double strength is thus secured; as the filling of amalgam not only protects the root from decay, but greatly strengthens it. The How four-pin crown has been in use for several years by me, and gives great satisfaction when set in the following manner: It will be remembered that the pins are long and are to be bent around a post which is by the inventor intended to screw into the root. Instead of this I use a flat or three-sided post, enlarge the root at orifice as much as it will bear, and sloping to follow the shape of the root, enlarging but slightly at the last third. The tooth is nicely ground to fit the root, and to occlude properly with its antagonist; the post sharpened, slightly barbed, cut proper length, and marked, the pins are then bent tightly and fastened to the post with a small quantity of solder. If a band is used it is now adjusted and the crown fitted to it, a small quantity of oxyphosphate inserted within the upper third of the canal and the post pushed entirely up to place and held there until the cement sets; then a plaster investment is formed over the adjoining teeth and the crown itself. This will harden sufficiently in two or three minutes, when the surplus cement, if any, is removed with delicate instruments and a good quality of amalgam forced up into the root, and the lingual surface of the crown faced up with the same. This will be polished, of course, at a subsequent sitting.

It would seem that we ought seldom to extract teeth, but for many reasons they *are* lost and substitutes must be provided. Though ordinarily these are not difficult to manage, occasionally they tax the ingenuity to the utmost. To obtain a really good impression is often difficult. Indeed, I am led to believe that impressions for entire dentures are, as a rule, imperfect. It is usually

claimed that partial impressions are the most difficult, but I believe this to be a mistake, for the reason that the remaining teeth act as a guide and steady the tray, and the impression is less affected by the contraction of the muscles, especially movements caused by the material coming in contact with the soft palate.

The best material for all cases is no doubt plaster. I cannot conceive of any condition, where an impression can be secured at all, that plaster will not be best. Some months since, a gentleman came to me for a partial plate to supply the four upper incisors and one first bicuspid. The arch was high and narrow, teeth long, loose and bell crowned; the lower teeth very long and irregular and jaws incapable of opening wide enough for a tray. It seemed a "desperate" case.

First, strips of wax were placed against the lingual surfaces of the teeth, which had been previously dried. A piece of flexible card-board was cut to fit within the arch; plaster mixed quite thick, but so as to harden slowly, was then carried up into the highest part of the mouth and pressed up with the finger, then more applied to all the parts desired to have reproduced, and lastly the card-board pressed up and held in place while the plaster hardened; removal was not difficult and a good impression resulted.

For obtaining a full impression, an examination of the mouth should always be the first move and the finger introduced, not only to ascertain the condition of the tissues, but to try the ability of the soft palate to endure the presence of a foreign substance. When symptoms of revolt are manifested, the finger should be held in contact with the palate for some moments, the patient in the meantime being encouraged to exercise self-control; then a suitable tray selected, a piece of wax molded across the posterior palatal portion, and this introduced and held in position for a short time to further accustom the patient to the operation. A few earnest words should now be spoken to impress upon the patient the necessity for co-operation and the importance of securing a good impression.

These preliminaries need occupy but a few minutes, and will often obviate the necessity of repeating the operation before securing the desired result, or the worse alternative of accepting an imperfect and uncertain impression. The plaster now being carefully mixed, the patient sitting in an upright position, the tray is introduced, the posterior portion pressed up first and then the tray forced upward and slightly backward with slow, steady movement.



Excessive protrusion of the alveolar process, especially when accompanied by a short lip, is a problem for the solution of which several plans have been offered ; 1st, removal of the process ; 2d, use of plain teeth placed directly against or beneath the ridge ; 3d, plain teeth mounted with a thin rim of pink rubber ; 4th, gum sections selected, ground and adjusted as closely as possible to the natural gums. The first or heroic plan is undoubtedly the best, but is seldom practiced because of the timidity of the patients ; the second is objectionable because of danger of shrinkage of the alveolus, and because such work lacks strength. The third is inadmissible because of the lack of support afforded by pink rubber, and on account of the want of natural appearance, for pink rubber resembles nothing else upon the earth except, perhaps, another piece of the same material. The use for which it seems best adapted is for packing joints in making gum sets, and it is certainly superior to any perishable material for that purpose.

The fourth plan seems to me the best, and appropriate gum sections will give good results in a majority of cases, though not always what we might desire. Perhaps the time may come when dentists will have advanced so far in skill and ambition that each shall possess a furnace, and construct porcelain work to meet the requirements of each case.

This branch of our work seems nearly at a standstill. In a practice extending over a period of twenty-one years, it seems to me I fail to note any material change for the better, and am constrained to think that (taking into consideration the number of Charlatans engaged in it) the mass of work *as a whole* is *below* the average of twenty years ago.

Have we really arrived at the pinnacle of our achievements in mechanical dentistry ? If so it behooves us more and more to save the natural teeth. Keeping in mind the atrophied jaws and clashing porcelain so frequently seen and heard, let us save at least a few teeth or roots to support a plate, or to anchor a bridge.

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#### DENTAL ART AND INVENTION.\*

BY DR. W. B. AMES.

During the past year but few inventions have appeared, though many improvements have been made on inventions of older date. This is not surprising, inasmuch as inventive genius is rare. But

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\* Read before the Illinois State Dental Society.

even if well-known principles are combined, and a piece of mechanism is made more productive of force, or adaptable to a larger range of purposes, or which saves more time, it merits the name of invention and should be mentioned as such. When we look into the history of any machine that has made an epoch in invention, we find that at first it was very primitive and had to undergo several stages of improvement before it reached its ultimate state of usefulness. Thus we have an ever increasing number of appliances and mechanisms of all kinds differing in minor respects. Among those pertaining to dentistry that have appeared during the past year, your Committee on Dental Art and Invention wishes to make mention of the following :

The most important invention of the year is The New Cord Dental Engine. The advantage afforded by it is its great power and steadiness of motion, due to the single continuous cord extending from the driving wheel to the pulley at the hand-piece. The principle upon which this engine is based was first used by Dr. James B. Morrison, whose engine was patented in 1871. Engines working on the same principle were afterward made by Dr. G. V. Black, Dr. Walter S. Elliott, and Dr. W. G. A. Bonwill.

The improvements of the Bonwill engine claimed for the Weber-Perry are steadiness, freedom from noise, easy motion, and adaptability of the handpiece to every position in the mouth. There is also an absence of "back-lash" and unvaried tension of the driving-belt when once adjusted is maintained. It is less liable to get out of order than any other engine except the suspension.

Experience has taught that when the electric system for dental purposes is used the force must be supplied from some large plant. The current produced by private batteries has proved a failure after years of labor and large expenditure of money. Operators practicing where there is no electric plant should content themselves with the pedal engine until such plants are located in their towns. So important are these plants becoming that it is only a question of time when all the smaller towns will be supplied with them. The current supplied from these large plants is uniform and always ready for use.

Improvements are constantly being made in artificial teeth and crowns and in the various articles used in the laboratory. New rubber-dam clamps and different forms of instruments for the operator have likewise appeared. Space cannot be given to the

description of these smaller articles which must be seen and tried before their value can be properly estimated.

The S. S. White Co. offered as new and novel instruments and apparatus, the How cervix clamp, the How root trimmer and the Magnus bench block for the laboratory. Dr. T. L. Gilmer exhibited at the clinics several electrical devices adapted by him to the Pumpelly storage battery. His root canal drier, cautery instrument and mouth lamp are all that could be desired in such instruments. Dr. J. J. Reed, of Chanute, Kansas, showed at the clinics a blow-pipe peculiarly adapted for use in places where illuminating gas is not obtainable, in that it employs gasoline as the fuel. The gasoline is contained in an ordinary chemist's wash bottle; the bottle should be about half full to operate properly. The long tube of the bottle is connected by rubber tubing with a foot blower, the short tube with a blow-pipe. By means of a spirit lamp attachment to ignite the vapor of gasoline, a very hot flame is afforded. Dr. K. B. Davis presents a novel porcelain crown which has baked into it a tube of platinum, inside of which is cut a screw-thread. Into this tube can be placed a threaded and shouldered pin, by means of which a band and cap, made for the special case, can be attached to the crown. Dr. S. F. Duncan presents an improved S. S. White, No. 311 disk carrier, the improvement causing the disk to be more firmly held. Dr. S. A. Milton, of Clinton, Mo., presents an apparatus for projecting warmed vapor of essential oils and anæsthetics against the walls of cavities, for treatment of sensitive dentine. Dr. C. T. Gramm, of Keokuk, Ia., presents his copper points for filling root canals in connection with gutta-percha. We find them to be nicely made and think that since such well made points can be obtained, they will be used more extensively. Dr. H. H. Gantz, of Humiston, Ia., presents a set of four saw-edged chisels designed for opening cavities, the several edges being brought into action by one stroke.

Dr. J. Austin Dunn exhibited, 1st, the Dunn Hand Matrix, which consists of a point for any screw-socket handle, small half-spoon in shape, flat and thin, made of soft annealed steel and can be easily bent to any contour between the thumb and finger. It saves much time and annoyance and is especially adapted to plastic fillings.

2d. Root canal dryers, cut from Whitman's artists' water-color paper. The point is made first by beginning to cut from straight



side of the paper. They can be picked up by the pliers and passed further into the SMALL END of a root canal than anything in use.

3d. Dr. M. G. Jenison's syringe with the Dunn adjustable needle point attached. The advantages claimed are : a large quantity of liquid, a strong continuous stream, no regurgitation and the medicaments do not come in contact with the bulb.

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#### DENTISTS.\*

BY DR. F. S. DUNCAN, JOLIET, ILL.

In casting about for a subject to present to the notice of this body, it occurred to me that perhaps something aside from discussions of a scientific nature might be beneficial and wholesome. This being the beginning of the second quarter century of our existence as a society, would it not be well for us to take a look about us and consider whether we are doing as much as we should for the elevation of our calling? That there has been great and rapid advancement in dentistry as a science within the past few years, can scarcely be questioned ; but in our greed for scientific knowledge is it not possible that we have to some extent lost sight of our advancement to a dignified standing among the learned professions? Have we not been receiving into our ranks men who are not a credit to the profession in any sense of the word? Men who care for nothing but the "Almighty Dollar," and are not very particular as to how they get it: Men who do unprofessional advertising and slop-shop work—at low prices but twice what it is worth: Men of undignified personal conduct, who care nothing for their own professional standing nor for the standing of the profession. I would say, however, that all of these men are not of the slop-shop variety, for some are skillful in their manipulations and above the average in their knowledge and treatment of diseased conditions ; at the same time they do not care if there be a code of ethics, or whether they are called doctors or barbers, so long as they by their questionable methods rake in the sheckels. These individuals are not found in the large cities only, but in smaller cities and towns.

Now somebody is to blame for this state of affairs. Who is it? Is it the society, the college or individuals? In my opinion all are more or less to blame. As individuals we are responsible for the class of persons we encourage to enter upon the study of dentistry.

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\* Read before the Illinois State Dental Society.

Too many students are taken simply because the dentist wants an office-boy, without paying wages, without considering whether he is a person of steady, studious habits, with sufficient preliminary education and ability to take up and appreciate the scientific and technical studies of dentistry, or the ambition to rise in his chosen calling.

The dental college or the private preceptor should exercise the greatest caution as to the kind of students admitted. The student should first of all be a person of good moral character and have the necessary preliminary education, with a natural inclination to mechanical art; for the dentist is not only a doctor but a mechanic—the latter predominating. He should be a person of good taste and have a liking for the beautiful, as he is also to some extent to become an artist.

I sometimes think our colleges err in this matter. It would seem that some of our institutions admit students who have none of these qualifications. Some of them cannot even read or write the English language at all correctly. I learned of a case not long since in which the applicant did not answer a single question of the very easy preliminary examination to which students are supposed to be subjected previous to being admitted to a college of dentistry, and yet he was passed and I suppose they made a *thing* of him which through courtesy to his alma mater we are obliged to call a dentist.

Too many of our colleges seem to be after the "Almighty Dollar" rather than seeking the highest good to the profession. Numbers instead of quality seems to be the leading object. Not only this, but they teach by example if not by precept that which is in direct opposition to our code of ethics. They advertise in glowing terms in the daily papers the advantages persons may enjoy by having their natural teeth treated and filled or artificial teeth constructed at the college. "No charge except for cost of material;" "all work free," etc. In this these so-called institutions of dental learning are teaching those under their instruction not only unprofessional advertising but also deception: for while they advertise fillings and plates at cost of material, they get almost if not quite as much for their work as the average country practitioner who labors early and late to make an honest living for himself and those dependent upon him, and does what he can to uphold the dignity of the profession by adherence to its code of ethics. If this is professional conduct for the college, why is it unprofessional

for the individual? Are we as a society and as individuals using our influence in the right direction if we fail to openly condemn such institutions which are doing under their charters what practitioners may not do under the restrictions of our code? At its last meeting the "Central Illinois Dental Society" passed by a unanimous vote resolutions condemnatory of the unprofessional course pursued by our colleges, referring particularly to advertising; and it seems to me that such a body as this should not be behind in this important matter. Said a college graduate to me—one who had been in practice a number of years, "I commenced the practice of dentistry wrong. If I had it to do over again I would advertise until I got a paying business established and then I would become professional, as Drs. so and so have done. They used to advertise extensively, but after they got paying practices established became ethical, joined a dental society and are now in good positions in colleges." My friend did not add, however, that these same colleges were advertising for both students and patients, so that after all our professors have not become so very ethical. They have only changed their tactics, and in such a way as to be recognized as O. K. by dental societies without coming up to the spirit of the code.

Of course in our colleges students are taught in lectures that it is unprofessional to advertise; but what does this amount to if he when he delivers it, does not practice what he preaches? Example is good to enforce a precept taught. Not long since I saw the advertisements of two dentists (graduates of advertising colleges) painted on fence-boards along the highway. Why not? the college advertises, why should not its graduates? A stream should not be expected to rise higher than its fountain head. Now, gentlemen, cannot we as a society lend our influence in some way to bring about a better state of affairs? Ought we not to refuse to recognize not only individual practitioners, but colleges as well, that advertise in an unprofessional manner? It seems to me that colleges should be allowed no more liberty in this direction than practitioners.

Should not we as individuals encourage a better class of students to enter our ranks, and discourage those who have not the necessary preliminary training nor the natural ability to become successful professional men? Cannot we in this way do something at least to make our profession more noble? A dentist should be



all that is implied in the word gentleman. He should be an earnest devotee of his chosen profession—not for money, but for the love of his calling and the good of humanity; a man of high morals, noble, ambitious, temperate, honest. No man has greater need of patience, forbearance, charity and other virtues than the dentist; and it would be well for us all to cultivate them. Under the prevailing circumstances the legal necessity of a dentist possessing a diploma from a dental college does not meet the case. No matter how many diplomas one may have, it does not make him any better as a practitioner, unless he has the qualifications general and special that go to make up a truly professional man.

The law is powerless to aid us in this matter. It is for the society, the individual and the college to eliminate the bad elements. Of course it can only be done by exclusion. It will be some years perhaps, before the good effects will be felt to any great extent; but if it were possible for colleges to-day to say, "None shall enter our doors who are not properly qualified as to previous training and education; and none shall receive our diplomas who are not thoroughly competent to enter practice;" and if they could be empowered to rescind the diplomas of their graduates found guilty of unprofessional conduct, it would not be many years till we could take our stand beside the medical profession without ridicule, and without anxiety as to whether we shall receive proper recognition as professional brethren.

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#### MEDICATED OXYPHOSPHATE FILLINGS.

BY CHAS. B. ATKINSON, D. D. S. NEW YORK.

The writer has been instructed, when capping exposed pulps, to mix oxide of zinc with creosote and oil of cloves, forming a paste with which to cover the exposure. Over this the thin oxy-phosphate was placed, intended to be a provisional filling during the time the pulp is depositing secondary dentine. This practice I have now abandoned, as will appear later on. For nearly two years the writer has employed various medicines in combination with oxy-phosphate cement, the particulars of which follow:

Let it be repeated that in the *mixing* of the ingredients entering into cement fillings, lies the secret, if there be any secret, of success in their use. It is believed that the crystallization once completed, no further change as between the phosphoric acid and oxide

of zinc takes place ; therefore an added medicinal principle, if possible to be associated with the crystallized cement, may be expected to have, at least to a degree, its normal remedial action. The agent most employed has been a mixture of creosote and oil of cloves, equal parts. In each instance of admixture of a *liquid* medicinal agent with the cement, the quantity has intended to be equal with the quantity of phosphoric acid necessary to its crystallization.

The addition of the agents named does not seem to alter the quantity of phosphoric acid required to mix the cement as ordinarily used.

In using medicinal agents in powder, the oxide and powders used have been equal in bulk, although in both forms the agent may be varied in quantity to meet the special requirements of each case. The general plan pursued by the writer is to mix the cement as thin as milk, and manipulate on a stone or glass slab until brought to such a degree of plasticity as the case requires, from a consistency competent to flow over a fresh exposure or to line the walls of a cavity, to such a density as would permit a burnisher to be used even with a mallet to compress it into a grinding surface cavity.

The advantages of these admixtures seem to be :

1. And probably the most valuable, the opportunity to exhibit constantly to the walls of a cavity remedial agents of varied capacity, according to the agent used.

2. Incorporation of these agents throughout the structure of the filling, permitting the medicinal action to be constantly present, especially valuable at the gum margin.

3. Resistance of the filling to germ action as well as a defense of the tissues with which it is associated from this same action.

4. A neutral influence resisting solution.

5. Increased hardness varying somewhat with the agents used. Add to these more extended control over the crystallization of the cement (the possibility of one mixing giving opportunity for the satisfactory setting of a complicated bridge, or the insertion of several fillings, thereby promising a more uniform result), and increased resistance to thermal influence on the pulp, and we have a system that seems to promise a decided improvement.

*The following is a list of the specimens presented, each being indicated by the medicinal agent used in the mixture:*

1. Creosote and oil of cloves—equal parts.
2. Eugenol.
3. Carbolic acid, deliquesced.
4. Oil of cinnamon.
5. Oil of cloves.
6. Creosote, pure.
7. *Creosote and oil of cloves*, equal parts, and *Iodoform*.
8. Creolin.
9. Campho-phenique.
10. Chlorate of potash, powdered.
11. Salicylic acid.
12. Camphor, pulverized.
13. Sulphur, powdered stick.
14. Iodoform.
15. Oil of wintergreen.

Numbers 1 to 7 have been fairly tested in use, and are about equal in durability, manipulation and time of setting. Ten minutes is considered a fair statement of time, although by proper handling this may be extended almost ad libitum. Experience with the remaining eight mixtures has yet to demonstrate their durability. They are submitted on their merits.

No effort has been made to control the color of these specimens.

It is obvious that the operator's intelligence must select such shade or shades in combination (of oxide) as will secure a proper color in the mixture.

These mixtures have been used in capping fresh exposures due to accident and those the result of extensive caries; in this latter instance after removal of sufficient decay and control of such remaining septic matter as was sometimes left, rather than to directly expose the pulp, although now the writer's practice is to freely excavate even to the surface of the pulp and to remove *almost*, if not quite *all* infected matter within the cavity.

In some cases the excavation is carried to where the inflammatory process has but commenced in the dentine without serious disintegration and the advantage of having the enamel wall supported by nature's medium is embraced, in which cases, perhaps two remedies are used to almost the exclusion of others. The cavity is well soaked with a solution of iodoform saturated in ether, or oil of cloves and creosote, equal parts. The more extensive the caries the more call is found for the iodoform solution; perhaps in



half such cases the iodoform is used, in the other half creosote. The medicated cement is flowed or packed, as the case may be, directly over the exposure, if there be any, without any other intervening element than in those cases where the creosote or iodoform is indicated.

The same mixtures are used in pulpless teeth.

Further than the uses stated, this system has been employed in retaining inlays of porcelain and of metal ; in setting retaining fixtures in pyorrhœa cases, and in regulating cases, placing crowns, and in temporary repairs of artificial dentures, which have stood the test of wear admirably and quite unexpectedly.

This last refers particularly to the setting of blocks and one or two isolated teeth in rubber and gold plates.

A consideration of the specific therapeutic action of these several mixtures has been purposely omitted, as it would furnish matter for presentation under another caption and seems properly outside the scope of the present paper.

Finally, it is deemed proper to say the odor of these specimens is greatly due to their association in being packed together, as well as to the large proportion of medicinal agent used in each mixture. The quantity of remedial agent may be varied, and also combinations may be made among those shown, which to a considerable extent, modify unpleasant odors.

One example only will be mentioned—The iodoform if mixed with *creosote* will be found to be almost masked.

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## PROCEEDINGS OF SOCIETIES.

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### IOWA STATE DENTAL SOCIETY.

(Continued from page 826.)

Wednesday, afternoon session, May 7, 1890.

#### DISCUSSION OF CLINICS.

DR. J. W. WASSALL, Chicago: My operation consisted in filling root-canals. I followed the common method of filling with chloro-percha. The tooth operated on was the second lower molar, the distal canal was large and easily filled ; after some chloro-percha was introduced into that canal the greater portion was filled

with the gutta-percha cones. There were two anterior canals in this tooth, both were fine. These canals were filled, without being first enlarged, with gutta-percha solution, then a tapering gold wire was inserted into the canals instead of the gutta-percha cone. There is no particular virtue in gold wire, except that even when slender it is stiff, hence it can be introduced into the most tortuous canals. Gold wire is only useful in very fine and tortuous canals when they are not enlarged, a method which I do not practice. There were some difficulties in this case. The tooth had not been prepared properly for root-canal filling as is always advisable, by previous removal of the pulp and disinfection; I found each of the pulp canals containing a small portion of living pulp near the apices. After this was removed there was profuse hæmorrhage, which it took me about an hour to control and then it was not satisfactorily done. In this the hæmorrhage was due to a hæmorrhagic diathesis, which was noticed the last time teeth were extracted, the hæmorrhage lasting a day and a half.

As a disinfectant I use oil of cassia.

DR. SOUTHWORTH: My operation consisted in drying gold in the cavity, the gold having become moist, excavating or cutting away with a file or bur the portion of gold which was in contact with the saliva, thus cutting a fresh surface; then drying the film on the gold, and continuing with the filling. There is a difference of opinion with regard to whether the surface is annealed or not; which, is correct, I am not prepared to say. Some one who investigated the subject, claims that gold could not be annealed without a heat of six hundred degrees. Another writes me that he does not consider gold annealed unless it becomes a bright cherry color. So there is a question as to whether gold has been annealed or dried sufficiently to allow number thirty gold foil to be used. If we take number thirty gold foil and run it through the lamp until it is cherry red, using small pieces, press them together even with the burnisher and they are welded together so one cannot get them apart. If we take the same pieces of foil and throw the flame on them by the process I have mentioned and thus anneal the gold, or give them the same pressure they appear to be as well united as that that has gone through the flame and has assumed the cherry red appearance.

The greatest trouble seems to be in getting the flame where it is desired and keeping it there. I have never noticed any difficulty

about the teeth either in checking the enamel or by the symptoms as indicated by the patient.

Report of the Committee on Dental Art and Mechanism, by Dr. W. P. Dickinson, Dubuque :

The S. S. White Dental Manufacturing Company, sent me a new engine that most of you know is called the Perry-Weber engine ; an engine which was manufactured for Dr. S. G. Perry, of New York, being an improvement on the Bonwill engine. I have had that engine in practical use in my office for some little time, and to say that I am delighted with it is a feeble expression. I do not know that I ought to say that it has no weak point, or that there is nothing about it but what could be improved ; that is quite possible. We have thought many times when instruments have been brought to our notice that they were absolute perfection, but it was shown that they could be improved. I think that this is the highest type of an engine that we have at the present time. The engine is in this room and was used this morning by Dr. Monfort in his clinic, and will be used to-morrow morning at another clinic. There are two instruments that Dr. How, an inventor, in the employ of the White Co., has brought out. One is the Cervix Screw Clamp. I received it too late to test. There are two or three of them in use in this city, and they have an almost unqualified approval. The Root Trimmer of Dr. How, for preparing roots for crowning, came also too late for trial. H. D. Justi also sent me a Root Trimmer. I think the original was brought from Paris, by Dr. Harlan. I do not know anything about it practically ; it looks as if it might be quite useful. This is the How trimmer, and this knife is sharpened on both sides ; it can be adjusted by these two screws which will carry it nearer or further from the center, being rotated by the hand. Those who use nitrous oxide gas and need a mouth prop, find in this a nice little appliance called the Nevins, which is made in such a way that it can be placed in the mouth and reversed so as to carry it out of the way. I have not used it for that purpose, but the shorter sizes I have used for a rest to the jaws in filling teeth. I find it very valuable in such cases. The Wilmington Dental Manufacturing Co. sent me some Merriam files. They were fully illustrated in an article written by Dr. Merriam, describing them, in the March number of the *Archives of Dentistry*. I think it is not necessary to give any very extended description of them. There are various forms. Here is a full set of thirteen that Dr.



Merriam has sent for exhibition. I would hardly know where to put the limit to their use at the chair in preparing the edges of cavities, and for filing off overhanging margins.

Dr. Elliott, of Connecticut, sent me his separator, rubber dam holder and rubber dam weight, and an amalgam that he makes. It is a very effective little holder and, withal, very inexpensive. Many of us have been in the habit of using some appliance of this kind for the purpose of stretching the rubber and keeping it out of the way in operating ; many of you saw it used this morning. The weight is suspended on a circular wire, and makes no difference how the patient's head may be, it keeps the rubber taut all the time. The separator has been in use by many. The principal separators we have heretofore had, the Perry and the Parr, have been very expensive ; most dentists have thought that they were too expensive. This is a little separator which is quite universal in its application. This screw here closes together. That can be taken out and put on the other side, so as to make it useful on either side of the mouth. Dr. Elliott is also the inventor of a suspension engine, and there are quite a number of specialties in the way of appliances that he has brought out. He is a man now nearly seventy years of age and has nearly given up practice. Dr. Ivory, of Philadelphia, has sent me his double bow separator, four clamps, improved clamps, rubber dam clamps, cervical clamps and new broaches. He also sends the Elliott separator. The cervical clamp is quite familiar to the profession. I have found it to be the most effective clamp of the kind. The clamps for holding napkins and rubber dam I think the most of you have seen. The double bow separator I consider the most effective we have for the teeth back as far as the bicuspid, or separating the bicuspid from the molars. It can be left in the mouth during operation and is entirely out of the way ; when used on the upper jaw it will hold the lip up out of the way. It separates the teeth and holds the rubber dam up over the cervical margin.

Dr. Ivory sent me the other day, a sample of a new broach that to me was certainly a novelty. It is a very fine piece of steel, not cut around, but is like a fine screw running down ; they are as fine as any of our broaches, and instead of barbs, they are turned like a screw into the pulp canal.

Dr. Gilson, of Boston, has sent me samples of rubber cloth, polishing wheels, paper polishing strips and paper discs, sand-paper

and emery. He has also sent me a sample of cord splice; I saw Dr. Hunt demonstrating their use yesterday. I have a sample and any one can see it if desired. Dr. Gilson also makes those matrices, I think, that Dr. Rogers spoke of last evening.

The Keller Medicine Co. has sent me one of their engines which has been in use in this city and is liked very much; it is in this room and can be examined. There is an appliance that was exhibited last year at the Chicago Dental Society anniversary; also, it is known by many as the Baltimore Rubber Dam Clamp. I think for cases, especially of the lower teeth, where it is difficult to secure the rubber dam, this is the most effective instrument that I have ever seen. The two jaws of the clamp can be drawn together and the rubber stretched over them and put down and closed on the tooth sufficiently to hold it, and then draw the rubber dam over it and crowd it down, and it can be put on so securely the patient cannot get rid of it. There are three sets of jaws—the large, the medium and the small—and the separating jaws are made in the same way, slipping on with the points, and the separating is done by just reversing the motion, drawing those on between the teeth. I have found one thing in the use of these clamps that is not stated in any of their circulars. Sometimes the shape or contour of a tooth will take one of the larger jaws on the outside of the tooth and a smaller one on the inside, or *vice versa*, just as may be indicated.

Gideon Sibley, of Philadelphia, sent me samples of his pellet gold and amalgam. I know nothing about the use of the amalgam, except the trial of it in a few cases in my practice since it was sent me. Of course nothing can be said of the virtues of an amalgam just by using it in that way. The pellet gold I have used. I thought I had a sample of it, but I believe I almost used that up in my experiments with it. I am quite delighted with it as a means of starting a filling. There are many difficult fillings. Where we have been in the habit of cutting a groove or cutting a retaining pit, or starting points, with the use of this is quite largely obviated. It seems to pack right down like so much sand. There is no bulging up. You can make it in a shape so as to slide away from the instrument. Dr. Peterson, of Dubuque, has presented a hot-air syringe, which I think you will all agree is not only an advance, but is far ahead of anything we have ever had in that direction. It is placed on a stand so that it can be adjusted over the annealing lamp, either the alcohol or gas lamp—just such as we use. The tube running from here comes

up almost to this cap, the coil being wound around something which leaves a chamber here. This tube goes through the cap and is soldered. This goes through the coil; that lower end is open; the tube here is a continuation of the tube here, so that there are fifteen inches used up in this coil; this being heated it compels the air being forced out of the end of this tube at the top, to go down through this chamber with air that is heated by radiation in the coil. It can be kept a certain distance above the lamp so as to keep it warm for drying out cavities and canals. Dr. Southworth, while operating this morning, used this hot-air syringe. Dr. Wilson referred to the copper canal points which are made by the Iowa Dental Refining Co., at Keokuk. He has samples which can be obtained from him after the meeting. I think that the mere seeing of them will convince you of their usefulness.

I have had sent me from the St. Louis Dental Manufacturing Company a set of crown drivers and an instrument for removing the shell from the teeth; these were invented by one of our Iowa boys, known to most of you, Dr. J. B. Vernon. I have been told by some who have used them that they would not part with them for three times their value in money.

Dr. Gantz, of Humeston, Iowa, presents four instruments for opening up cavities in teeth. They have been trying to find a name for them, so as to christen them—I hardly know what to call them. They are serrated, or saw-toothed instruments, made very sharp and very hard. These are of four forms, a right and left, and I think that any one examining them who desires anything of the kind will be convinced of their usefulness. They are not on the market, but I understand the Illinois Dental Manufacturing Company, of Chicago, have the patterns, and they are to be made by them. Speaking of the Illinois Dental Manufacturing Company reminds me that I have here some instruments made by them. Here is a separating saw which is very useful. There is a small frame and a large frame, and it can be put at any angle. Here is another little instrument that they have recently brought out. It is a pulp canal instrument, with a fine slot in the end to put cotton down into the pulp canals for drawing out or for medication. The slot I am unable to see with the unaided eye, but I see it with the magnifier, is very finely and very smoothly cut, and I have seen a demonstration of it which has illustrated its usefulness. There is a little instrument made by them for me after a pattern of my own, which is



made neatly ; a chuck for using in the hand. It is simply a chuck with two little pieces put into the chuck with a very fine groove for the purpose of putting a needle in breaking that off and making a very fine drill for a starting point, or for general use for a small drill. Dr. Johnson, of Chicago, exhibits a little cotton holder for waste cotton. In operating, as you take the cotton from the mouth, instead of throwing it on the floor or in the waste-basket, you drop it in there from your instrument, and these four points catch it and take it away. This is just fastened up against the operating case. Another valuable feature about this, and which the inventor did not intend, was the disengaging of the cotton from the broaches and pulp instruments. There is one thing that dentists have waited a long time for, and that is a thin finishing strip. There is a cloth finishing strip made in four grades by Dr. Charles T. Howard, of Rochester, New York. I think that is certainly the best strip that I have ever had.

Dr. W. B. Ames, of Chicago, has sent me a sample of a medicated gelatine for use in the treatment of pyorrhœa, and for the treatment in the closure of fistulæ. This sample has thirty per cent of sulphate of zinc. It can be cut in any shape, and it is the readiest means that we have for the treatment of such cases.

Dr. Ames has also sent me samples of his new copper amalgam. I see I have spent more time in the exhibition of these than I intended, so I will not speak of it specially, but I have a few samples of that which I will exhibit to those who desire—to those that use it. It was spoken of last night by some one, also this compound of chalks for taking impression. I have a can of it that was sent to me and I have used enough of it to demonstrate its value, and with Dr. Ingersoll I am under the impression that it is pounded plaster and pumice stone, or something of that kind. It, however, will do all that is claimed for it, I think. It has certainly proved itself a valuable adjunct to my practice for taking impressions. I have not made any dies with it, but I have no doubt from some impressions which I have over at my office that it is perfectly feasible. That came from the Wilmington Company. They also sent me this flask. Every one who has seen it thinks it is an improvement over the Dunham. There is a thirty pound spring over this plate. This filler is simply for work when the flask is used. There is a bed in this and there is a heavy large screw there which insures its durability. Dr. Palmer, of La

Crosse, exhibits a new daily journal giving an index and expense account ; an account for a week on the double pages and at the end a dental register and memoranda, that will commend itself to the systematic dentist, and there ought to be more of them. I had a little experience once in getting out a register, and I found a great many dentists did not have any system at all about that. Now, so much for operative dentistry.

In the line of mechanical appliances the White Company has sent me a bench. Fastening to the end of the bench is a rubber surface to do filing on. There is also a little anvil, as it might be called. It is made in two sizes. This is the larger. Here is a little appliance, a drip cup for the lathe. There is an adjustable nozzle here that will allow the water to drop just a single drop every two or three, or even more seconds, or it can be adjusted so there will be a very fine stream. It also can be adjusted so as to bring it right over the extension lathe, whether it be large or small.

H. D. Justi sends this adjustable ring flask cup, of course, the use of that in the end of the cup, breaking away the plaster, these little perforations catch enough so.

Here is an anatomical articulator sent by the Wilmington Company. There is a pretty good representation of the size of the lower jaw. I think there is only one thing we cannot get directly, and that is a perfectly square lateral motion.

I have here the No. 2 Mann Vulcanizer ; a vulcanizer which has recently come to the notice of the profession. When I was in a neighboring State a few years ago I saw it in the office of a gentleman who is well-known in a certain line of his profession ; in fact, a professor of dentistry ; and he said he thought it was by far the finest thing that he had seen.

The pot is a very heavy copper pot, banded with this band, with two little lugs, with these levers for closing the vulcanizer. The packing is similar to the packing of the Hayes and other vulcanizers of that class ; and there is one valuable feature in it, the top of most vulcanizers will almost always stick, and require some little force to get it off, when the rubber packing is pressed in. The lower portion of this lever engages right in the under side of the frame, and in dropping these out of the way, those just break the joint and leave the cover ready to come off. The vulcanizer, I think, has just about the appearance of other vulcanizers of this kind. This came from the Keller Medicine Company.

DR. J. N. CROUSE, of Chicago, then made the following remarks: I have studied since I came here what feature of association would be most profitable to us here. You are well aware why I am here and what I want of you. Is there any need of a protective association? If so, what is the need? It is estimated that the Dental profession paid the old rubber company during the life of the two patents under which they collected a royalty from eight to ten million dollars. I am informed by attorneys that if at that time we had such an organization as the Protective Association is at this time, the profession need never have paid the rubber company any royalty. As you know, there were some feeble scattering efforts made on the part of the profession by a few individuals who paid out large sums to test the validity of the patents of the company, but they were faulty in that the whole profession were not back of it.

Mr. Affield was one of a firm of attorneys for the old Rubber Co. crowd and is entirely familiar with all their methods, and I think the Protective Association is to be congratulated in having his aid. Is there a necessity for a Protective Association? There are now in my hands applications from five different sources to give the status, or the legality of the patents. Five different companies that are now trying to impose, or insisting upon a royalty from the dental profession. For a dentist to get a satisfactory examination of a patent it requires a patent attorney to do it; and that is expensive business for an individual, but with the protective association it is one of the small things they can do; they can test, or have some one do so, where a royalty is claimed, and have the attorneys pronounce on the validity of those patents. It is not the design of the association, I want to say here, to interfere with any man's legitimate business, or any man's legitimate profit, but to stop the enormous profits of the parties to which the dental profession are a prey. The International Tooth Crown Company has twenty-six or twenty-eight patents. I have described them in a circular, and there is a synopsis of what these patents consisted in. Let us briefly run over them and see: On crowns they have fifteen or sixteen patents, which if the validity of these patents were held to be good, would make all crowns now being set, or ever having been set, with the exception of the old wooden pin, an infringement on the company's crowns; on the preparation of teeth they have a patent, on cutting it off; they have a patent on destroying the pulp, driving it out with a stick; they



have a patent on filling the end of the tooth ; have a patent on the cement filling used in the tooth ; one even on cements used for this purpose. This, briefly, is what they have on the preparation for crowns. On the matter of bridge work or plates, they have patents on taking an impression of the cusp ; they have a patent on articulating ; have a patent on investing a piece in plaster. This is sufficient to show you that if the claims of the International Tooth Crown Company could be made to stand good every man practicing dentistry must, in one way or other, pay a royalty to that company ; and I will venture right here, while I think of it, that there is not one man in Iowa but what would be paying the International Tooth Crown Company a royalty were it not for the protective association as it now stands, with their claims. And it is now their intention, and has been, to get something that would hit every man. If a man is not setting crowns he is filling roots, or doing something whereby they could come in and claim that a man was infringing their patents.

No man, individually, could stand it to test the patents. It would be cheaper for each man to pay the royalty than fight if he had to fight the claim alone. It is for this purpose, uniting the entire strength of the profession ; at least, to get enough of the strength of the profession, to get up enough of a corporation, whereby it comes very light on each one.

The fee that the Protective Association asks each one to pay is \$10. Ten dollars from 15,000 dentists means \$150,000. Twenty dollars, which is the additional \$10 that the Protective Association makes provision for by signing the by-law—the Protective Association ask you to sign a by-law which gives authority to the officers of that organization to collect \$10 more, making \$20 in all that each member could be asked to pay, and that, if 10,000 dentists went into it, the association would have \$20,000 as a fund invested in building or in some paying security and take the revenue of that and do what you please with it and stop the patent abuses—it would not take much to do that. Appoint an educational committee ; see that every college is doing its duty. Appoint three men, giving them a salary ; save the abuses, in many cases save the young men being fooled out of time and money. I think the money expended on many colleges is a fraud on the young men who go into the institution. So much for the college.

Now, then, there is something more. How do we know what

further claims will be made? They are talking of vast combinations, and are we going to continue as a profession without some permanent organization? A question will come up here in the minds of individuals: How many members has the Protective Association got into it? I am not going to answer that question just yet. We have a pretty big organization, several thousand dollars in the bank and our bills all paid. I can tell you how many members in the State of Iowa are in the Protective Association. There are just 34 members of the Dental Association of Iowa in the Protective Association. You have about 400 in our profession—34 out of 400. I am not saying this in the way of criticism particularly, because I know that on account of the crops of the farmers in the western States the dentists have a hard time; and if it had not been for the New England States and the States East, we could not have succeeded as we have, but I am not a bit discouraged; this association is on large, comprehensive principles. It is on a basis that makes probable a permanent organization. If I die in my efforts to make it such, some one will take up the cause and it is bound to stand. The dental profession cannot be annoyed with patent claims and abuses of one kind or another when it can be stopped so easily, and I know it will be stopped. Each individual interested, say with a thousand in the association—we have over that—each member in the association getting one we would have two thousand, and so on. Isn't that a cheap and economical way to double the membership of the dental association? Now, I hope there won't a man go out of this room that is not already a member of the association. If he has not got the money, I have asked the secretary to draw a contract in the form of a note and have you sign it and send your ten dollars to the Chairman of the Protective Association on or before January 1st, next.

What, then, do we offer in return for the ten dollars? We agree to furnish the best counsel; furnish all the testimony, bear all the expenses of suit if you are sued. We think it can be done and it cannot be done if you do not take hold and work together. But I want you to understand that every one that goes into the protective association makes it stronger and they can be protected without many suits. They know we have the testimony. They know of certain bridges we have that will beat them when they get into a square fight. I have a bridge twenty-seven years old that was

taken out before leaving, and the man who made it and the assistant who assisted are both living. It was surprising to me so valuable a thing as bridge work should have been used by an individual, he seeming to be ashamed of putting anything in the mouth that could not be removed on the principle of any one putting any dirty, nasty thing in the mouth that could not be removed. Now, we propose to take care of the members of the Protective Association. We do not propose to take care of the whole dental association. It is formed in such a way that this dental association won't be protected unless each is a member of the Protective Association. If I should tell you that a proposition was made to the attorneys of the protective association that members of the protective association would all be allowed to use all the inventions of the International Tooth Crown Company if they promise not to take any more members, would you think we have many members? Do you think we have got any strength? I defy them to take up a suit and go into court. We dare them to bring suit. I have been daring them with their detectives in the room. I say they do not dare to take up a suit and go into court to contest any of their patents. Now, there is just one thing I want to say and that is this: That the International Crown Tooth Company, as you may know, appealed from the decision of the lower court in New York on the question of the crowns. They were beaten there in that suit; that is, the court—the fourth district court of New York—decided that the Richmond Crown, the patent and the claims of the patent company were not good; not of value, and the International Tooth Crown Company, as you all know, probably, appealed from that decision to the Supreme Court. Now, what condition is that in? In appealing that, they, of course, were obliged to take up the whole question; they were obliged to take up the other side of the question; they could not separate the record; the whole record had to go up and this bridge patent had then to go through the courts and get a decision of the upper court, which might be adverse to the lower courts on the bridge which they had won there. What is the status of it now? They have settled with the individual against whom that suit was pending. So they are out of the field, and there is nobody watching that case except Richmond himself.

Well, it did a great deal of good and may be fun for all still. He took out patents and sold them to the tooth crown company,



and went into court and swore he knew they were of no account when he sold them. He went so far they got him in jail. He is out now. Now they have got suits in the Supreme Court. What is the result? I might say here louder than anywhere else without any unjust criticism. It was a very poorly conducted suit; it was poor in that they had not time to collect testimony, and in the next place they didn't seem to have money enough to hire such attorneys as had reputation as patent attorneys. The consequence was the suit was conducted in a very loose manner; a great many stipulations went into that that would not be allowed to go in by the attorneys of the protective association, and the Crown Company confidently expect the Supreme Court to decide that crown patents are valid. The protective association expect they will do so too. What is going to be the result? When the International Tooth Crown Company get such a decision they will start the printing press and try to demoralize the dental profession, and are very likely to do it unless we get it well understood that the Supreme Court don't prevent the association taking up its cases and getting a barrel of them, that is, a small barrel. What we desire to do is to test the validity on the evidence we have. The Crown Company are confidently expecting, and undoubtedly preparing themselves for such decision, and may have started the printing press now, although the suit is nearly a year off. They will start injunction suits against the dental profession, but they will not get anything from the members of the dental protective association. If the association had not been organized I venture to say that one-fourth of the dental profession would be signing those licenses to-day. They stated in an interview that came direct enough for me to believe it that it would cost them two hundred thousand dollars. They have only sued me for sixty thousand dollars, a moderate amount. The imprisonment I do not care much about; I could serve out the imprisonment in such a cause without much disgrace, but to pay the sixty thousand dollars would worry me some. What will be the status of this suit I have not a doubt, but the communications have gone about, saying if I was not ready to lay down that they would make me sick; that they had sued me for sixty thousand dollars, and stating all over the country, "We have got him demoralized." It is like the preacher that went into the church to preach a funeral sermon for a spirit-medium's husband, and he went on and preached the sermon; and when

he got through it did not suit the medium, and she was there and asked the privilege of making a few remarks, and she got up and gave this minister the very devil for this sermon ; didn't like it, and after she got through and sat down he got up and said : " Well, brothers and sisters, I have been preaching for twenty-six years ; in that time I have preached a great many funeral sermons, but this is the first time I was ever sassed by the corpse." And now, gentlemen, without turning a serious thing into ridicule, but with a hope that you will get your fingers on your ten dollars, and if you are already a member of the association, get your finger on your ten dollars and loan it to your brother member. It will be something which you will never regret. Now, I want to be clear. The Association is getting ready with the evidence to put their cases in the Supreme Court of the United States as quick as the mail can take it there, as against the reply which the Crown Company will make against any man who is doing crown and bridge work, or cutting off a tooth, or doing such work. Those are all involved in that crown suit, and they will apply for an injunction, and we are expecting to file a reply for any such man, whether he be a member or not anywhere.

Mr. President, I thank you and the gentlemen present for the attention you have given me. I hope you will appoint a committee that will have stick-to-itiveness, and that it will get every man who is at the convention to join us.

DR. I. P. WILSON : I would just like to say that I joined the Protective Association and before doing so I figured up the amount of money I had paid out to the rubber company, and it figured up \$800 that I had paid out as royalty to the company, and I bought the rubber besides.

[TO BE CONTINUED.]

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#### SOUTHERN ILLINOIS DENTAL SOCIETY.

The Southern Illinois Dental Society held its fifth annual meeting in the Phoenix Opera House, Chester, Ill., Oct 21, 22 and 23, 1890. President G. A. McMillen, of Alton, in the chair.

The session was opened with prayer by the Rev. J. D. Crenshaw, of the M. E. Church.

The secretary being absent, G. W. Entsminger, of Carbondale, was appointed Secretary *pro tem.*

The mayor of Chester, on behalf the citizens, delivered an address of welcome, which was responded to by President G. A. McMillen.

The President's address was then delivered by Dr. McMillen, after which a paper entitled, "The Dental Profession of Southern Illinois," was read by Dr. G. W. Entsminger, of Carbondale.

The paper, with the President's address, was then discussed by Drs. Corbett, Prichett, Rohland, Jennelle and others. The subjects were then passed.

Dr. A. H. Rainey, of Centralia, then read a paper on "Implantation." This was discussed by Drs. Rohland, Jennelle, Corbett, Prichett, McMillen, Torrence and Dr. McBride, of Perryville, Mo. Subject passed.

The chair was instructed to appoint committees to draw up appropriate resolutions on the death of Dr. Homer Judd and Dr. M. D. LaCroix. The President appointed as such committees respectively C. B. Rohland, T. W. Prichett, L. Betts, J. J. Jennelle, C. C. Corbett, R. H. Canine.

Dr. C. J. McBride, of Perryville, Mo., at the evening session of the first day, read a paper entitled, "Half Day in the Office."

The discussion was opened by Dr. Prichett, who was followed by Drs. C. B. Rohland, R. H. Canine, G. W. Entsminger, J. J. Jennelle, L. B. Torrence, C. C. Corbett and Prof. Guy. Subject passed.

A paper on a case in practice from Dr. Brecht, was read by the President. Discussed by Drs. Harper, of St. Louis, McBride, of Perryville, Mo., and others.

On Wednesday, October 22, Dr. A. H. Fuller, of St. Louis, read a paper entitled "Pulp Capping;" and Dr. Rohland read a paper on "Operative Dentistry."

The discussion of Dr. Fuller's and Dr. Rohland's papers was opened by Dr. Jennelle, who was followed by Drs. Corbett, McMillen, Newby, Canine, Entsminger, Prichett, Harper, Fuller, Rainey and Prof. Guy.

On Thursday, October 23, the report of the Supervisor of Clinics was read and discussed by several members, and then passed by consent.

The committee appointed to draft appropriate resolutions on the death of Dr. Homer Judd and Dr. M. D. LaCroix, then made their reports, which were adopted and copies ordered to be spread on the records and sent to the families of deceased.



Dr. J. J. Jennelle then read a paper on "Treatment of Root Canals," which was discussed, and a motion was passed instructing Dr. Jennelle to have his paper printed in pamphlet form for distribution among members of the society, allowing him to use his own discretion in its preparation.

The next annual meeting will be held in East St. Louis, on the third Tuesday in October, 1891.

The following officers were then elected: President, L. T. Phillips, Nashville; Vice-president, N. H. Jackson, Greenville; Secretary, W. E. Holland, Jerseyville; Treasurer, L. Betts, Du Quoin.

The following Executive Committee was subsequently appointed: C. C. Corbett, Edwardsville; J. E. Brecht, Carrollton; R. H. Canine, East St. Louis. The society then adjourned.

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#### WESTERN AND CENTRAL ILLINOIS DENTAL SOCIETIES.

The joint meeting of the Western and Central Dental Societies held at Galesburg Oct. 14th and 15th was well attended by members of both societies; preparations for the entertainment of the two societies had been made by Drs. Davis, Coulson and Stone. The first day Dr. Luman C. Ingersoll's lecture at the Baptist church was largely attended by the citizens of Galesburg. Papers were read by E. M. Robbins, President Western Society; G. D. Sitherwood, President Central Society; Garrett Newkirk, lecture on the Principles and Practice of Regulating Appliances, etc.; Dr. Gilmer, Necrosis of Jaws; Dr. J. G. Whiting, Diseases of the Peridental Membrane; Dr. C. Stoddard Smith, Dental Legislation. The Clinics were well attended. The two societies united under the name of the Western Dental Society of Illinois.

The following officers were elected: President, D. E. Coulson, Galesburg; Vice-President, S. F. Duncan, Joliet; Secretary, W. O. Butler, La Harpe; Treasurer, E. K. Blair, Waverly; Executive Committee, E. M. Robbins, Chairman, F. J. Raymond, E. B. Call.

Peoria was selected as the next place of meeting.

The Secretaries of the Western and Central societies were instructed to collect all dues of members still in arrears in their respective societies, and to report to the Secretary of the new organization.

# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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## THE UNION DENTAL MEETING.

One of the largest dental meetings held in this country this year was that of the fourteen dental societies of New England, in Boston, Oct. 28 to 31, 1890. This meeting was convened in the Odd Fellows Hall on the evening of October 28th, in the presence of about 250 dentists, Dr. C. W. Clements presiding. At different sessions, one of the Presidents of the other societies represented presided. The first evening a paper was read by Dr. S. B. Bartholemew, of Springfield, Mass., on Professional Ethics. The doctor presented a thoroughly well-digested paper, which was discussed by several of the members. There will be no excuse in the future for our New England brethren going wrong if the doctrines laid down in the paper are followed. We hope the paper as *read* will be published in full. Dr. L. D. Shepard then gave a verbal history of the dental section of the Tenth International Medical Congress at Berlin, including a short resumé of the whole Congress. This was well received. It seems that a "Court" reception was tendered the delegates and 300 invitations were given out, of this number four were extended to odontologists. It seemed that as the dentists numbered a few more than one-twentieth of the whole membership of the Congress, that about twenty or thirty invitations should have gone to the Section on Odontology; but this was not to be so—so only four were taken into the sanhedrim or *sans-souci*. This breeze was gotten over after a time and all went merry as marriage bells.

The next morning the dentists attended clinics in the Infirmary

of the Boston Dental College, the whole of which we inspected with Dr. C. H. Osgood as our cicerone. This infirmary is extremely well lighted and well arranged for the purpose of a dental college and is heated by steam throughout. There are three lecture rooms, and the whole building is well equipped in every particular, except for practical work in chemistry. We saw no benches or other evidences that practical chemistry was taught in the college. The attention of the college authorities is called to this deficiency in their equipment, which we regard as one defect in their admirably conducted institution. The clinics were interesting, but the rooms were so crowded that only a few could see at a time, and we failed to get a very good idea of the morning's work. Some soft gold fillings, made by Dr. G. A. Young, of Concord, New Hampshire, were much admired by those who saw them, as were the operations of Drs. Townsend, of Worcester, and Evans, of New York.

The afternoon was devoted to papers—one by Dr. Thos. Fillebrown on Vitality as a Germicide ; one by Professor Charles Mayr on Organic Chemistry, and one on Abrasion of the Teeth by Dr. A. F. Townsend. These papers and their discussions consumed the afternoon. In the evening Mr. B. S. Ladd, of the Boston bar, delivered an interesting address on some of the rights and duties of dentists at common law. This called forth numerous remarks on suits for malpractice, of which our brethern in the East seem to have had some practical experiences. The Dental Protective Association was presented by Dr. Fillebrown in a masterly manner, and our townsman Dr. Crouse ought to feel highly complimented by the eulogistic remarks that were made by the speaker, and others who followed. This work is going on in the East, West, North and South at a rate which shows that ere long we will be banded together as one, ready to defend our rights against all extortions of whatever nature. Thursday the various societies met for routine business. After this was finished, Dr. J. W. Russell, of Brooklyn, read a paper on A Review of Copper Amalgam, which was followed by a paper on Capping Pulp with a copper cap, by Dr. A. J. Parker, of Bellows Falls, Vermont.

Thursday afternoon Dr. G. F. Cheney, of St. Johnsbury, Vermont, read a paper on Pulp protection by Cavity lining. This was followed by one on The Dental Pulp; its destruction, and methods of treatment of teeth discolored by its retention in the Pulp Chamber or Canals, by Dr. A. W. Harlan. These papers were discussed



until five P. M., when the visitors were taken in charge and banqueted at Hotel Brunswick, Dr. L. D. Shepard acting as toast-master.

An innovation was noticed at this dinner. After the soup a speech, and then after each course another; and when the dinner was over all the speeches had been made and the guests and hosts returned to the hall to listen to a paper by Dr. R. R. Andrews, on the Development of Enamel. This lecture was illustrated, and it was the *piece de resistance* of the whole meeting, as will be seen when the paper is published. Dr. Wm. P. Cooke then read a carefully prepared paper on New Formations in the Pulp Cavity, which was illustrated by photo-micrographs. Dr. Cooke says that of 5,000 teeth cracked or split open, about 20 per cent have calcifications, or new formations in them, which will easily explain the numerous failures in pulp cavity and canal filling.

Friday morning was devoted to clinics, the most interesting being a new method of making porcelain inlays with porcelain rods, by Dr. B. C. Russell, of Keene, N. H., and a case of torsion of a central incisor one year after the operation with a perfect result, by Dr. W. H. Pomeroy, of Gloucester; and the exhibition of the "Small" method of obtunding sensitive dentine with the thermal obtundent, operated by Dr. E. S. Niles, of Boston. After the clinics were over the meeting was adjourned. There were about 400 in attendance during the meeting, and all the sessions were well attended, even the last morning, which is an unusually good evidence of interest in the proceedings.

The exhibition rooms it is needless to add, were filled to overflowing during the whole four days. We have not elsewhere seen such a good exhibit; so well arranged or admirably conducted as was the one at Boston, due we believe, to the executive ability of Dr. W. P. Cooke and his efficient assistants, Drs. W. E. Page and H. S. Draper.

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"93."

Go where you will the World's Fair and the World's Columbian Dental Meeting forms a topic for conversation. The other day we were riding from New York to Boston, and behind us were two dentists engrossed with the latter topic. We listened and heard them discuss their plans with reference to attending the greatest congress of dentists the world has ever seen. At that time all the

modern ideas of the civilized world will crystallize into one harmonious whole, and the most stupendous exhibit of the age will be shown in Chicago, evidencing the progress of modern inventions, fabrication and intellectual growth. We hope to enlist the enthusiastic effort of every American dentist in this undertaking, and the hearty co-operation of the dentists of the world, by their presence in our midst in "93."

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DR. H. J. MCKELLOPS.

Wednesday evening, October 8th, at 8 P. M., a dinner was given at the Hotel Martin, New York City, in honor of the above gentleman, by his old time friends to celebrate his arrival from Europe on his way to his St. Louis home, and to tender to him a hearty welcome. About forty were gathered around the festive-board, and among the veterans we noticed Dr. A. L. Northrop, who presided in his usual easy and elegant manner, W. H. Atkinson, W. H. Dwinelle, J. N. Farrar, S. G. Perry, N. W. Kingsley, A. H. Brockway, C. S. Stockton, J. B. Littig, Dr. Younger, of San Francisco, Cal., Wm. Wallace Walker, and the remainder of the Jersey boys. Dr. McKellops was looking unusually well, and after some hesitation was induced to recite in his inimitable style the "Ivy and the Oak." At a late hour the symposium was broken up and New York bade good-bye to him to the tune of "Mac's a jolly good fellow!" Long may he wave.

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RETAINING POINTS.

Nowadays it is the fashion to declaim against retaining points for cavities in which gold is to be inserted. Never was there a greater fallacy. Take the simplest contour filling, which may be one in an incisor tooth with a living pulp, and it goes without saying that the first pieces of gold should be securely fastened to a given point or points to insure its non-tipping. Be the cavity ever so well prepared for retention of gold, a point or two in the thicker portions of the labial or palatal wall and one near the cutting edge, or at least a properly shaped groove is indispensable for the prevention of leakage into the cavity. Other cavities in living teeth call for the use of retaining points—not in the direction of the pulp—for the pinning of gold to the abraded ends of teeth. Many times pulpless teeth are rendered more useful by the drilling of retaining

pits in the proper direction, saving strength of tooth structure and avoiding the loss of profile walls whose cutting away would disfigure the countenance, by restoration with gold. Operations on the teeth with gold under the most favorable circumstances are transitory instead of permanent, and it were death to estheticism to avoid the use of pits or points as an aid to perfection of mechanical impaction of gold to prevent unsightly discoloration, in order to say that all cavities should be prepared in a manner that renders unnecessary the boring or drilling of pits, or points which will permit of the pinning of gold to a cavity. Selah!

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## DOMESTIC CORRESPONDENCE.

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### LETTER FROM NEW YORK.

NEW YORK, November, 1890.

*To the Editor of the Dental Review :*

DEAR SIR: Incidentally New York is astir. From foreign countries, the mountains, sea shore and rural districts, many dentists have returned, better for the changes, and now, for the work in hand. Never was there more need of energetic action coupled with wise guidance. The bulletin board is full of announced projects looking toward progress, and we will hope that wise counsel will prevail. In and around New York are four active societies, and so constituted as to enable much of co-operation in a social and mental spirit. By pooling their issues, productive movements can be matured, so we take the optimistic view of the situation. The proposition of Dr. Boedecker for founding a Dental Club is in the hands of good committees, and we shall be mistaken and certainly disappointed if it does not result in one of the most progressive movements that has ever been projected by dentists. Social banquets have been on the tapis in compliment to several gentlemen, one of which was given to Dr. Miller, of Berlin, who is on a flying visit here for rest. Unfortunately, according to general report, the ten dollar dinner at Delmonico's was thought to be dear at five. Was it pure culture to serve him in that way? We trust he was satisfied when he reached Buffalo, as report says he sat down to a *poetical* banquet given by Dr. Barrett. Dr. Younger called on us en route from Berlin. He was never looking nicer or feeling more so ; he



is in earnest—no moss growing on his efforts ; fame knows no sluggard.

The first session of the Odontological Society convened at their new quarters in West 43d street, near 5th avenue. This being their first meeting in the elegant building built by the New York Academy of Medicine. There was not a large gathering ; several members were noticed in the lobby who did not appear in the meeting. A committee was appointed to report at the next meeting, resolutions in memoriam of Dr. William A. Bronson, who had gone home during the summer vacation. A man to be endeared in the memory of all, for he had the esteem of all.

Drs. Geo. Wilson and Winkler presented papers by invitation on the Treatment of Approximate Surfaces of the Teeth. Dr. Wilson was a former student of Dr. Atkinson, and we think none of the doctor's students have excelled him in neatness of contour work. Dr. Winkler is a son-in-law and student of Dr. Patrick, of Charleston, S. C. Both of these papers will merit the attention of thinking men. Dr. Wilson is an earnest advocate for a high standard, as much as conditions will permit. He laid down fixed principles before his audience for guidance. He advocated the necessity of inborn skill allied with prolonged effort, and said, "excellence could not be attained in a day."

This is Dr. Wilson's first appearance before societies, and should not be the last, for he acquitted himself ably. Dr. Winkler's paper was more an advocate of what may be, or is termed, conservatism. He is a very bright operator, and does just what he advocates, face fillings more often, and contour, when, in his judgment it is indicated ; he puts thoroughness into his operations. Let the readers keep in mind who their preceptors were. Every reader of the journals know who Dr. Atkinson is. Dr. Patrick, whoever does know him, knows him to be one of the ablest dentists in the South.

That two such good papers should have such a lukewarm reception seems unfortunate, yet I am sure they will be more fairly dealt with in the larger field of observation, the journals.

Dr. Geo. S. Allan was the first to talk to the papers. I cannot call it a discussion. He said as usual "It was an able paper" (Dr. Wilson's) and then he told us, it was antique for he had said all this way back last April, in his exhaustive paper before the First District Anniversary Meeting. Dr. Allan says such papers are

only emitting facts *ad nauseam*. What we want is to be told how to make these beautiful ideal operations, and how to overcome the difficulty involved in such work. He never seemed to us so emphatic as in this discussion. He impresses us that he is carrying a process of gestation or that he is in labor pains. "How's this?" he says "the theory of the day is contour fillings. The practice is face fillings." He then gives an illustration from the Pickwick papers where the advice is given to shout with the crowd. At this point he gave a very peculiar smile which was largely taken as an approval and that he shouted with the crowd. This would not attract any attention if the doctor was not seemingly trying to carry water on both shoulders, for he claims to be an ardent advocate of contour fillings.

Dr. Allan must know that the crowd only carry the advanced things by vote, the best things are always in the minority. It is said that "Fanaticism at the beginning of a century may at the end, become conservatism." Dr. Allan asks why the practice is face fillings. We should answer for many reasons. First, lack of belief—and doubtless entertained by some good men honestly; second, lack of ability, not all dentists can make skilled operators; third, some are not willing to pay the price it costs to be skilled; fourth, more money is claimed for quicker and easier effort. We would say to Dr. Allan if he really desires to become an expert, take lessons of such men as he sees doing this work. Or, is he spurring a dark horse to show that the advocates of ideal work are making their practice exhibit face fillings. One thing is certain that circumstances lead men of judgment, and they are governed by them. Dr. Jarvie said there was no doubt but that the ideal conditions of a set of teeth were a well-arranged arch with all teeth approximating and a free space at the margins of the gums, and it was, or ought to be, the purpose to preserve these conditions as far as circumstances would admit. Dr. Allan gushingly replies you are forty years behind, I said all that in my late paper and he reiterated the claim that the central point of his late paper was "The Theory of the Day was Contour Fillings, the Practice is Face Fillings." It will be remembered that those who listened patiently to his paper singularly, with one exception, failed to understand that he was an advocate of contour filling as can be readily seen by referring to the published paper in the *Cosmos* and the discussion.

There is an unsolved riddle I think here. Dr. Lord announced

after the discussion had proceeded thus far, that there were six gentlemen who were expected to be present and discuss the subject, but for some reason they were absent, he thought they were afraid of it. Whether Dr. Allan was reserving in his mind that men are advocating one thing and doing another, or because they are back-sliding, or that it is not possible or practicable to put into practice the ideal, we are not quite convinced. Let those that read, think and decide.

Allow us to say right here, the time will come when the skilled operators will be widely sought and awarded a compensation commensurate to their services, and the indifferent operators will not have the demand from the most appreciative clientèle. To-day our skill is not rewarded in any proportion to its value. The theory of to-day by advanced practitioners means an unbroken arch and a complete sanitary condition of the oral cavity. Intelligent ambition can only demonstrate the practice.

The First District Society convened for its fall meeting also in the new rooms of the Academy of Medicine. The society is now under the direction of younger men who are implanting themselves into new soil vigorously, and by the end of the year we will better tell how much absorption will take place. One thing is evidenced on the start, that unusual display is being made of so-called conservatism. For this meeting a paper was imported from Jersey by Dr. Sanger, subject, "Conservative Practice in Dental Surgery." I do not think I will say more of this paper than that Dr. M. L. Rhein was first on the floor to reply, and he was fully imbued with the idea that the amiable author had labored expressly to make an attack on him as the representative of radical practice.

Dr. Atkinson brought to the attention of the society the new and wonderful pus-killer-Pyoktanin. He was asked to write the word on the blackboard and all memorandum books came out. The Jersey boys were out in large numbers and we noticed they all took this word down. They are not going to be left. If there are no mosquitoes in Jersey next year, you will see Pyoktanin written all over the landscape, and this will prove conclusively that a skeeter is of microbial descent. The wonderful permeating power of this new remedy is so marked that every dead animal will reveal plainly which color of the drug killed him. There are two colors, purple and yellow. They will either have the blues or the yellows.



Jersey dentists don't need any of this for personal application. Oh, no! No flies on them.

They had special purpose for being at this meeting besides chaperoning Dr. Sanger. They are as Dr. Kingsley says, coming to be leaders of all great reforms. They are now moving to mobilize Congress to pass a law against all patents on processes in the mouth. Not bad if it can be done. It may not be known, but it is intimated that the World's Fair originated in the New Jersey Dentists' Society; certainly the American Dental Congress did. Importations that come that way, there is no duty "in to them."

Dr. Kingsley is full of good things. He presented the idea to the first District Society of getting up a banquet in honor of the old (duffers) then he scratches his head and says we will call them the Patriarchs in dentistry. It is desired to carry this out some time during the winter. Even this idea was suggested to the Jersey Society by Dr. Kingsley the night before at their meeting and he got them to take the lead. They appointed a committee to confer with others. He said he thought it would be wise that as these ye old practitioners, were on the decline, that we should give them one more square meal before they go, so the committees are working it up. The old men are expected to appear in full dress. Dr. McKellops was present at the meeting and he looked so pretty and so smiling through his sedativeness which he must have acquired during his prolonged stay in Germany. His reception was very cordial which aroused him to make really a brilliant oration. The Doctor never seemed fuller—of good things. He said among many things in a very emphatic way, like Mulberry Sellers with his hand pointing high in the air, "he'd got money that it can't be done," when a hole has been drilled through a tooth between the roots as was shown, such a blunder can't be made a success. Long live the dear Doctor. He will be a happy man when he gets that big present that is coming from New York. We did not get a look at him after the complimentary banquet given him the next night by New York at the Hotel Martin, doubtless he has arrived in St. Louis ere this.

I have mentioned Pyoktanin but as I have heard that Chicago has got it, I will only refer the reader to the *Cosmos*, for Dr. Atkinson's remarks on its wonderful virtues.

The October meeting of New Jersey was never so fine.

Forty-four brilliant, wide-awake, well-dressed practitioners sat

down to a really nice dinner for one dollar each, and after that was prudently discussed, the tables were removed and the meeting was called to order. This is the way they are doing it every two months, and it is a marvel how fraternal all are. Jersey dentists have got law on the carpet. Laws for regulating practice and Congress against patented processes in the mouth. They have taken hold of it in dead earnest, and they are going to make an appeal to all societies for help, both mental and financial. Dr. Bonwill was the invited essayist—subject, "Patent Laws." The Doctor never looked better nor delivered himself better. Only forty-five minutes this time. The Doctor is an able man and he has been a very useful member of his calling. Like all who are in earnest he has his variations.

A letter was received from Dr. Parmly Brown, in explanation of his italicized talk at Excelsior Springs. It amused all. He claimed that it was only figurative, so they accepted it and made a figure of him, and agreed to put him into the archives. Only one thing occurred that marred this meeting. The Dinner Committee had replies from eleven that they would be at the dinner so they provided accordingly, and at the hour of 6:30 P. M. there were forty-four hungry dentists present. This called out the genial disgust of Dr. Stockton. He is the Demosthenes of Jersey, but he is never heard to stutter when he talks. He tried to talk as though he were mad, but his face denied it. He said because of this delinquency he was crowded out, and was obliged to go down to the lower café for his dinner; but he did not look or act as though he had suffered any loss. I wonder what charm there is in being a successful editor. So much for Jersey.

I met your editor on Broadway en route for the "hub" meeting, of which he was to be one of the spokes. I had the last edition—October number—of the REVIEW in my hands. I walked up to him and presented the copy instead of my hand. I said, "this is the biggest thing on earth." His face shone as though he had been manicured. You know he's an editor. I congratulated him on the successful issue of the October number. I said, "this looks like energy. Now," I said, "do it again." Such energy merits all our support. No mildew on that number. That Justifies the prediction: give us what we want, and we want it. Why, it is as big as the *North American Review*. We read it all through in forty-eight hours, and felt as though we had been to the meeting in person. The best

evidence of success is success. Success is the *ultima thule*, but not so with many men in our calling whose only ambition is for "biling rubber," as Dr. Watt said in the October number of his journal.

The Brooklyn Dental Society has opened a new deal, and we think a hopeful one for the society. It has been in travail for several years. It has adopted the dollar dinner at all the meetings. Dr. Sanger read a paper (here's Jersey again). Subject, "Disease of the Gums caused by Decayed Teeth." Another great reform. Good Lord, deliver us now. Who says we don't grow—in knowledge at least. We felt afraid to go for fear we would catch it, as we had a decayed tooth under treatment—nothing like novelties.—*Ex.*

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THE TENTH INTERNATIONAL MEDICAL CONGRESS—SECTION XIV—  
DENTAL SURGERY.

BY W. C. BARRETT, M. D., D. D. S., BUFFALO, N. Y.

(Continued from page 836.)

The first International Medical Congress in which Dental and Oral Surgery and Practice was recognized as an integral part, was the seventh, which met in London in 1881. This was also the first International Congress that engaged the serious attention of the world. The British Dental Association had then but just been formed, and the English law regulating dental practice and placing the dental registry under the charge of a Medical Board, was but coming into successful administration. Under the lead of men like Sir John and Charles Tomes, Sir Edwin Saunders, Smith Turner, Oakley Coles, and others, dentistry in England was made a part of medicine, and associated with it as intimately as was possible with a class of men, only a comparatively small portion of whom held a medical degree. The mother profession took very kindly to the idea of incorporating reputable dentistry as a part of itself, and the natural outgrowth of the movement was the establishment of a dentist's section in the forthcoming Medical Congress, which it was determined should entirely eclipse all previous Congresses, and mark an epoch in the history of medicine. To secure this end it was desirable that as many as possible in all the different departments of medical science should be enlisted, and the newly organized or re-organized, specialty of dental surgery was therefore distinctly recognized and assigned a place by the side of the other departments of the Congress.



The signification of this movement should not be underrated. It was the first time in which medicine as a profession, had given to dentistry the right hand of fellowship. Frequent demands for this acknowledgment had been made in the different countries, but hitherto without effect. It is true that in some, dentistry was a part of medicine, because only medical men possessing the distinctive medical degree, could legally practice it. Dental science was not, however, in these countries a part of medicine; it was medicine itself. But now, for the first time, we were accorded all that we could consistently ask, and the dental qualification was recognized as sufficient to admit to a meeting of medical men.

This was a very radical departure. Heretofore no degree, save the distinctively medical one, had been sufficient, even for distant affiliation. Now a class of men whose practice bore a near relation to that of medicine, but a considerable proportion of which practice was solely and essentially mechanical, were formally adopted as an integral part of the profession, though not strictly within its pale. But this was done in the expectation and upon the understanding that dentistry should draw yet closer the line, and, adopting a code of ethics modeled after that of the mother profession, should inculcate the necessity for a medical training more or less complete, so far as professional necessity demanded. This was the tacit if not the expressed understanding, upon which the dental section in the Seventh International Medical Congress was formed.

The movement was a decided success. Not only was the section very largely attended by dentists from all over the world, but it stimulated those of Great Britain, especially, to renewed exertions and gave to English dentists a recognized standing, appealed to their professional pride and built up a professional feeling, beat down all opposition to the law and secured for it the respect of the people, without which it could not be enforced, and made the British Dental Association the recognized head of a united specialty throughout Great Britain. It did more than this. It stimulated the same pride of their calling in the dentists of America, and aroused a desire for a closer union with medicine on the part of most thinking men.

Some of the papers read at that meeting were of great importance, and from that epoch may be dated the grand advance made in oral pathology during the past ten years. Antiseptic surgery was then in its infancy, and to the stimulus afforded by such papers

as that of Milles and Underwood, and others read at that meeting, our present conception of the pathology of dental caries is due. It will always be a source of pride to me that, with other American dentists, it was my privilege to be a member of the Seventh International Medical Congress.

The Eighth Congress met in 1884, at Copenhagen. It was not the fault of medicine that no dental section was then organized. The dental profession of Denmark was too weak, and was itself too intimately a part of medicine to assume the great task of conducting such a section. The Congress itself was not a large one, and as no one stood ready to take up the responsibility of sustaining the work, no special provision was made for the dentists in that meeting.

The Ninth Congress was held in America. An unfortunate dissension in medicine, the disgraceful scramble for office and the fight over the question of control of that meeting, had nearly wrecked the dental section. So many men were disgusted by the factious spirit in medicine and withdrew from support of the dental section, that at one time its successful organization was more than doubtful. Those miserable quarrels in the mother profession are probably responsible for the holding aloof of some prominent dentists from support of the Congress of 1890. But finally a truce was agreed upon, and the dental section of the ninth Congress was organized and conducted to a successful issue. At this time the American Medical Association, to bind yet closer the interests of the dentists to the Congress, passed a resolution expressly acknowledging the dental diploma as a qualification for admission into a medical society, and adopted it as a degree in medicine.

The Tenth Congress was that held in Berlin during the past summer. The dental section was organized very much upon the plan of that of the seventh, held in London. Its chairman was Prof. Busch, of Berlin, and there were honorary presidents selected for each of the principal countries represented, with an honorary Secretary for each. The attendance was large, and the papers and discussions of great interest; but there was no era-marking presentation, nor any specially new subject broached which now promises to result in such a series of observations and studies as followed the meeting of the section in the seventh Congress. It may be that in Germany it will materially affect the struggle between the *Zahnaerzte* and the *Zahn-Kunstlers*, but if so, the indications are not as yet very pronounced.

It is no reflection upon the dentists of Germany to say that the section labored under a disadvantage in that, while the matters of greatest interest came from English speaking members, the chief official language was German.

It is quite possible that to those whose mother tongue was not English, the matter may present itself in quite a different light, but so at least it seemed to the English and Americans themselves. The Germans naturally felt that, as they were the hosts for the occasion, and were charged with the expense and labor of the congress, and as it was held among a German speaking people, the proceedings should mainly be conducted in that language, and so there was, on the part of some Germans, a constant grumbling at the amount of time devoted to English papers and debates. When a paper was presented in English or French, by far too many of the Germans would get up and leave the room with an appearance of impatience. I think that this discourtesy was not as marked in other nationalities when German papers were read. Prof. Miller, who acted as a general Secretary, came in for much unmerited censure on both sides, because he could not apportion the time satisfactory to either party. I had abundant occasion to see what his labors were, and how thoughtfully he struggled with the difficulties of his embarrassing position. It is hard to say what the section would have been without him.

There were in the neighborhood of four hundred members of the section. Of these something more than fifty were Americans. It is difficult to fix the exact number, because so many attended who, for some reason, did not take out membership tickets. The sessions were held in the morning, while the clinics occupied the afternoon, the evenings being given up to dinners and other acts of hospitality. The former were held in the Ressource, in Oranienburgerstrasse, or in the Urania, while the latter were given in the Dental department of the University, in Dorotheenstrasse.

The principle interest of the meetings centered in the lantern exhibits of Prof. Miller, of Berlin, Mr. Mummery of London, and Dr. Andrews of Cambridge. The specimens of Prof. Miller were especially beautiful, but because of the dissatisfaction of some of the Germans at the prominence given to the English speaking exhibitors, he only exhibited a part of his slides, and hurried over these in a way that was exasperating to Americans.

The paper of Mr. J. Howard Mummery, on "The Agency of



Micro-Organisms in Caries of the Teeth," was a very able one, and his exhibit most remarkable, not only as completely demonstrating his essay, but in the technical beauty of his preparation.

Prof. Miller did not read his paper, and, as I said, gave but a part of his exhibit. I think, however, the paper will be published in the Transactions, for they would be incomplete without it.

Dr. Andrews' paper was also crowded out, although he had an opportunity to present his lantern exhibit. There will doubtless be an opportunity for Americans to read it, as it was presented at the late Union meeting held in Boston the last week in October. Mr. Mummery's paper may be found in the number "*The British Journal of Dental Science*" for October 15.

There were some valuable papers read by Germans, but of these it is not necessary for me now to speak. The "official" papers presented were fine. Of these one was in German, by Dr. Holländer, of Halle, upon Bromide of Ethyl; one in French, by Magitot, upon Pyorrhœa, and three in English, that of Mr. Mummery already referred to, that of Dr. Talbot, of Chicago, on Irregularities, and one by the writer of this sketch, on Crown and Bridge work. The other papers came under the head of volunteer contributions, only a comparatively small number of which could be read.

The Clinics at the University, were largely attended, and some of them were of great interest, notably those of Dr. Younger, of San Francisco, on Implantation, and those of Prof. Busch, on Extraction. The latter was not a very grateful sight to Americans, who, for the first time, witnessed the almost wholesale extraction of teeth at a clinic. The work was, I think, skillfully done, but I did not witness it.

The grand section dinner was marred by the fact that speech-making commenced too early. It is always well to put guests in good nature before commencing to talk to them. The stomach must first be filled to quell the savage in man, and then and not till then will he attend to the intelligence. As it was, the speechifying began at the end of the soup and lasted through the dinner. The waiters were kept back to give the orators a chance, and this exasperated the hungry and waiting listeners so that it was difficult to secure attention to the speeches, and they were received in a spirit of protest as preventing the satisfying of hunger, and thus both brain and belly suffered. However, the banquet was a fine one, if things had been served separately.

There were dinners and lunches in profusion. Commencing Sunday evening, there was a reception and supper in the grounds of the Exhibition Building. Monday evening was given up to private hospitality, save for the official reception. Tuesday evening was the grand dinner given by the city of Berlin. Wednesday evening came the Section dinner in the Salon of the Ressource. Thursday evening Prof. Miller gave a dinner which was confined to the official members of the section, and Friday evening was the not-soon-to-be-forgotten dinner of Dr. Sylvester, in Sommerstrasse. Saturday evening was a general winding up and departure of many for home.

It was announced that the next Congress would be held in Rome, Italy. The climate forbids the assembling at the usual time, August, and the meeting will probably be held in May. The dental profession of Italy is not strong, and a successful dental section will demand the assistance of the members from other nations. The situation is complicated by the fact that the Columbian Exposition in Chicago, instead of being held on the anniversary of the Columbian discovery, is postponed a year, and this brings it in the Congress year, 1893. A great dental meeting will be held then, and this must interfere with the Congress Section. We have accepted a place in a Medical Congress. In fact, we petitioned for it, and it having been accorded, we are in honor bound to sustain it or give due notice of our abandonment of it. The medical profession of England, America and Germany have admitted us to full representation upon our asking it, and we cannot now shirk the duties incumbent upon us.

But, luckily, there will be abundance of time to attend the meeting in Rome and get back early enough for the Chicago meeting. In view of the weakness of the dental profession of Italy, a meeting of the officers of the section in Berlin was called, another final "official" dinner was disposed of and an auxiliary association was formed, with Magitot at its head, each member of which pledged himself to do what he could for the success of the dental section in the Eleventh Congress. It is hoped that a respectable number will attend from other countries, and that thus the perpetuity of the section may be secured.

In my next I propose to give a sketch of the Tenth Annual Meeting of the British Dental Association, at Exeter, in the South of England, which it was my good fortune to attend.

[TO BE CONTINUED.]

## THE TENTH INTERNATIONAL MEDICAL CONGRESS.—A PEN PICTURE.

BY DR. GEORGE D. SITHERWOOD, BLOOMINGTON, ILL.

On the fourth of August, 1890, the Tenth International Medical Congress met in Berlin, the capital city of the German Empire. It is a beautiful city of 1,500,000 inhabitants, with clean wide streets paved with asphalt. The houses are mostly built of cream colored stone or brick covered with hard cement in imitation of stone, of a uniform height of about five stories. It is one of the most orderly cities in the world.

At eleven o'clock on Monday morning the Congress convened in the Circus Renz, a very large theater centrally located, where all the general meetings were held. The great circular building was beautifully decorated and presented a magnificent appearance. The Stars and Stripes were conspicuously displayed with the colors of many nations; while gay colored bunting with evergreen wreaths were twined about in arches where flowers, ferns and pretty mottoes bade us "welcome." The bright uniforms of the British army surgeons and the golden trappings of the German medical officers helped to relieve the more somber ones of the French and the conventional black of the Civilians. This was the first time the French uniform was seen in the German Capital since the Franco-Prussian war. Hundreds of ladies in pretty dresses occupied the boxes. About 6,000 doctors from all parts of the world were present, 659 of them being from America.

Prof. Virchow, the President, delivered the opening address. He welcomed the members in behalf of the city of Berlin, and spoke of the great joy he felt in seeing so many representatives of different nations there to join in the work of the Congress. The Emperor, he said, shared these feelings and regretted his inability to greet personally the members of the Congress, but his majesty had deputed a member of his household (Prince Leopold, his cousin), to receive a large number of the physicians. The Imperial Government, as well as the individual German states, had assisted the undertaking wherever possible. Although medical science could not influence social or political problems, it could materially mitigate the sufferings of humanity. It was the highest office of International Medical Congresses to impress upon physicians that medical science was a science wholly devoted to the benefit of humanity.



Dr. von Boetticher greeted the Congress in the name of the Emperor and the German Sovereigns, and spoke briefly of the bright example given by the Emperor in furthering social reforms. Dr. von Gossler said that no nation could claim precedence in medical science. Now in one country, now in another, some great progress was made, and Germany recognized willingly the great services to science rendered by her neighbors. Sir James Paget was received with stormy applause when he mounted the rostrum and made a short speech. After him Professor Bouchard, of Paris, who spoke in French, and Professor Baccelli, of Rome, whose speech was in Latin, addressed the Congress.

Surgeon-General Hamilton of the Marine Hospital Service of the United States, said :

*“Mr. President and Colleagues :*

The pleasant duty of responding on behalf of the American delegates to the gracious welcome extended to us, has been assigned to me. America is grateful for the generous attendance at the last Congress and I assure you she takes an interest in the success of this Congress—a success now assured by reason of the Herculean labors of the Secretary-General, Dr. Lassar—she has taken unusually deep interest because of the respect and admiration her physicians feel for the profound learning and social graces of the physicians of the old world, and particularly of our present hosts.

We came to see and appreciate your greatness ; I say this in all sincerity for the United States, the product of a single century, does not expect or pretend to equal in the fine arts and sciences, the product of all antecedent time as represented here. Having seen, we agree that “the half has not been told us.”

Here are gathered in council many of the men whose books we have read, we may see the rooms in which they teach, speak to them face to face, and we will carry to our homes and lecture rooms the most pleasant and delightful recollection of Berlin and Germany. We also join in congratulations with our confrères of other countries, that we have as President one whose fame has been truly International for more than a quarter of a century ; whose supremacy in pathological medicine is recognized in every country inhabited by civilized man. Happy the German medical profession in possessing a Virchow, and thrice fortunate the Congress over which he presides !

In the International flower garden the delicate floweret newly arrived, glistening in the morning sun, naturally takes a more retired place than the full-blown rose, and so the relative infrequency of American names on the programme, is natural evidence that our delegates prefer to hear your mature reflections rather than put forward our own.

In the name of my colleagues I again thank you for this gracious and hospitable welcome."

At 1:30 a short interval took place, and then Sir Joseph Lister delivered a lecture on the present position of antiseptic surgery.

Monday evening a garden party and reception took place in the Ausstellungs Park. This is a beautiful park to the northwest about two miles, just outside the city proper, on the right bank of the river Spree in the suburbs of Moabit. It is the place where all the expositions of Berlin have been held since 1879. The park contains quite a number of public buildings, band stands and theater. The main building is a large structure of glass and iron, built somewhat like an English railway station. It is divided into many large rooms, and in these rooms the eighteen sections held most of their meetings, except that of section XIV, Odontology, which had three places for sittings, one being in the Urania, a popular scientific institution in the northern part of the park, one in the Ressource on Oranienberger-Strasse, and one in the Odontological Institute on Dorotheen-Strasse. The two last mentioned are down in the city. The clinics were given in the Odontological Institute. It was, no doubt, very easy for those who understood German to find all these places and keep up with the meetings, but for many others it was quite difficult. The sections were numbered as follows: 1. Anatomy; 2. Physiology and Physiological Chemistry; 3. General Pathology and Pathological Anatomy; 4. Pharmacology; 5. Internal Medicine; 6. Diseases of Children; 7. Surgery; 7a. Orthopædic Surgery; 8. Midwifery and Gynecology; 9. Neurology and Psychiatry; 10. Ophthalmology; 11. Aural Surgery; 12. Laryngology and Rhinology; 13. Dermatology and Syphilography; 14. Odontology; 15. Hygiene; 15a. Railway Hygiene; 16. Medical Geography and Climatology; 17. Forensic Medicine; 18. Military Sanitation. The classification and naming was better than that of the ninth Congress. Programmes of the Congress, guide-books of the city and a daily journal, all printed in the three official languages, German, French

and English, were freely given to all the members. The catalogue of the exhibition of instruments and great display of many things pertaining to medicine, was printed in German only.

A Ladies' Committee was in constant attendance in the Sculpture Gallery of the Academic Art Exhibition in Ausstellungs Park, who gave out souvenir books containing directions for the many excursions and entertainments given for the special benefit of the ladies of the members of the Congress. The main building in the park was made beautiful for the Congress in the exhibition of a large number of fine paintings and marble statuary, many of them master-pieces.

Tuesday evening a grand banquet was given in the Rathhaus (city hall) for gentlemen only. Four thousand invitations were given out and there were few regrets. Four thousand doctors seated at 700 tables spread with choice viands, where the popping of corks and the jingle of glasses kept time with the band that was playing the airs of many nations, was an inspiring sight, even if they did grow merry and loud in eight or ten languages, that made a sound through the great corridors like the roll of the waves in some mighty cavern on the rock-bound coast of the sea. On Wednesday evening each section was given a banquet separately. Thursday evening several great balls were given, the principal one being in the winter garden of the Central Hotel.

Many excellent papers were read in the section of Odontology, of which none were listened to with more interest than those of Mr. Mummery, of London, on "Micro-organisms;" Dr. E. S. Talbot, of Chicago, on "Irregularities of the Teeth;" M. Morgenstern, of Baden-Baden, on "New Researches on the Formation of the Enamel and the Dental Bone." Of the untiring work of Prof. Miller and Prof. Busch and the rest of the committee, it is impossible to give sufficient praise. Prof. Miller acted as interpreter for a number of papers, repeating each sentence in English or German, as the case might be. In the clinics, Dr. Younger, of San Francisco, exhibited a case of ten anterior superior teeth, implanted six months previous, that healed without suppuration and were doing well. He also implanted in the jaw of a young German, a bicuspid taken from a mummy about 3,000 years old. The mummy tooth was very brittle and the crown was accidentally broken off, but the doctor grafted on it the crown of a tooth taken from a young lady's mouth.



Dr. Busch, of Berlin, gave a clinic on extracting teeth. He used a gentlemen's large upholstered chair, placed a round pillow at the back of the patient's neck, and standing behind the chair, extracted the teeth—if they were easy to take out; if difficult, he broke them off, digging the roots out afterward. The day was very warm. He wore a long linen duster that was soaked with perspiration well down the breast; he had removed collar and tie. The skirts of his duster served for a towel, on which he wiped his bloody fingers, thus presenting a novel and extraordinary appearance to the victims of the low-backed chair, on whose neck-breaker pillow some of them wept in great terror.

Dr. George Cunningham, of England, exhibited a new low-fusing continuous gum which was not fully satisfactory but may prove of much value. Dr. George W. Melotte attracted considerable attention with his blowpipe. Of the bridge-work, crown-work, dental splints, electric appliances, and many kinds of filling it would be unprofitable to write.

On Saturday the Empress (Agusta Victoria) visited the Congress. She came out to the park in her carriage behind two beautiful black horses. A lady companion and the usual court attendants accompanied her. She walked through the Medical and Scientific exhibition stopping to examine many of the instruments; looked into various apartments where the different sections of the Congress convened; and so quietly withdrew that many were not aware of her presence. She is a fine looking woman, a little above the medium height, of the typical German blonde type, and the mother of five children, all sons, the eldest being about eleven years old.

The last, and perhaps most interesting paper before the general session, was that of Dr. Horatio C. Wood, of Philadelphia, on Anæsthesia. He stated, "That out of many millions of inhalations only three deaths recorded as directly due to Nitrous-oxide gas! Could anything be safer? Chloroform kills, as near as can be made out, proportionately four or five times as frequently as ether. The use of any anæsthetic is attended with an appreciable risk, and no care will prevent an occasional loss of life." He advocates forced artificial respiration promptly in case of accident, to avoid the use of alcohol and all drugs except strychnine, digitalis and ammonia. His essay, however, has been widely published and every doctor should read it.

Saturday evening a farewell reception and fest-concert for the members of the Congress and their ladies was given in Kroll's Gardens. Refreshments were served at tables in the garden where a fine band discoursed martial music, and a great chorus sang German songs. A classical concert of nineteen numbers was given in a beautiful theater in the gardens, in which some of the best artists of London, Stockholm, Dresden, Moscow, Wein, Berlin and Wiesbaden took part.

So with music and song, feasting of body and soul, there closed a week of such generous hospitality as can only be enjoyed by doctors in the imperial German capital. Those who remained until the next Tuesday had the pleasure of seeing the Emperor and Empress ride in a grand parade, in which 20,000 soldiers took part. The Emperor is a small man with curling mustache and fair complexion, and was dressed in a light blue uniform covered with many badges. He rode with fine military grace a chestnut-sorrel horse. The Empress rode in her state carriage behind six black horses.

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## REVIEWS AND ABSTRACTS.

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### INSTRUCTIONS, TABLES AND DIAGRAMS FOR THE EXAMINATION OF HUMAN CRANIA.

SERIES A, AMERICAN DENTAL ASSOCIATION.—Section VI, Physiology and Etiology of the American Dental Association, is now prepared to proceed with the examination of human crania as may be seen by the following instructions, charts, etc. Applications for blanks should be made at once by those who contemplate conducting any examinations. The investigations, as will be seen by the subjects inquired into will be scientific, extensive and thorough. The following are the rules to be observed in the examination of prehistoric crania.

The diagram of the permanent teeth *only* will be used in connection with Table A, as children did not receive the same sepulture as adults in savage or prehistoric times—their remains are rarely if ever found. The diagram is furnished for the purpose of expedition in the examination of crania, and is to be used with the symbols that accompany it, and with no other marks or symbols. All other observations will be recorded on the tables.

In recording the remains of disease and irregularities, very few, if any, of the symbols will be needed in any one case; but in the examination of thousands of crania, most, if not all, may come into use; hence the necessity of having them present to the eye of the investigator during the examination.

Regularity is shown on the diagram; if, however, no marks of disease or irregularities are found on the crania examined, the diagram will remain as it is, unmarked; but the record number of the cranium must be recorded in its appropriate place on the table, and where a catalogue number is used in a collection of crania the catalogue number must follow the record number on the table.

The numerals on the diagram will be used to designate the tooth or teeth that are either grooved, pitted or granular, and will be marked on the last division under the heading, "condition of the enamel," on the table.

Rotation of teeth on their axis is to be marked on the diagram on the tooth so rotated, thus **S**. The degree of rotation is immaterial in this inquiry.

Partial division of the crowns of teeth will be marked on the diagram on the crown of the tooth so divided, thus **V**.

Supplemental or multiple tubercles will be marked on the diagram on the tooth at the site of their occurrence, thus **Π**.

Crescentic enamel is to be marked with a crescent on the tooth so formed, thus **U**.

The location and extent of caries of the teeth will be marked in black on the diagram. As all bones take the color of the soil in which the subject was buried, the color of caries is unworthy of note. The progress of caries ceases with vitality.

As the inclination of the roots of teeth may be observed in most prehistoric crania, the roots of the teeth, when divergent, will be indicated by marking in the center of the diagram, thus **JL**

Convergence of the roots of teeth will be marked in the center of the diagram, thus **UJ**

Fusion of the roots of two or more teeth will be marked on the diagram connecting the roots of the teeth, thus .....\*

Fusion of true teeth with aberrant teeth, mark on the diagram at the site of the true tooth so connected, thus .....

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\* This and the following conditions are noted by certain marks which cannot here be conveniently reproduced.



Confusion of two or more teeth will be marked on the diagram by connecting the crowns so confused with a bar, thus .....

When teeth previously separate in their germs or follicles subsequently become joined to their neighbors, owing to a non-development or absorption of the dental septa, the union is a pathological process of simple fusion. But when teeth become connected, either wholly or in part, during their inceptive development by a process of intimate union of the enamel, such union cannot be viewed in any other light than that of a process of physiological confusion.

Malposition by transposition of teeth will be indicated on the diagram by a curved line connecting the crowns of the teeth so transposed, thus .....

Malposition of teeth will be indicated by marking near the corresponding tooth on the diagram, either outside or inside the arch, thus .....

Supplemental teeth, either outside or inside the arch, will be indicated on the diagram, at the site of their appearance, thus ....

Supplemental teeth are sometimes in alignment; they will be marked on the diagram, between the teeth they are in alignment with, thus .....

Supplemental teeth are as a rule well formed and are true teeth, though frequently smaller than the regular series.

Aberrant teeth will be marked on the diagram at the site of their appearance, thus .....

Aberrant teeth are irregular in form and size.

Diminution in the number of teeth will be marked on the diagram, on the teeth, at the site of the deficiency, thus ||

The partial development or the non-development of the intermaxillary bones is the cause of cleft palate, with or without hare-lip, single or double; but a partial deficiency in the development of the intermaxillary bones does occur, without hare-lip or cleft palate, by a non-development of the incisive process, and consequently carries no incisive teeth.

The intermaxillaries may be vertically or laterally deficient in development. In a vertical deficiency all of the incisors may be present, but too short to occlude with the lower incisors. In a lateral deficiency, one or both of the lateral incisors are usually absent and the lower incisors upon occlusion pass over the upper, and the maxillaries are changed in form by correlation.

Teeth that are lost during the life of the subject will show, at the site of the missing tooth or teeth, a contraction and diminution of the alveolar process (bony cicatrix), which mark on the teeth of the diagram corresponding to the missing tooth or teeth, thus . . . .

The loss of teeth after death (post mortem) will show the root cells of the teeth in the alveoli; these cells should be closely observed, as to direction, number and size.

In the fusion of the roots of true teeth, the fusion of aberrant teeth with true teeth, the confusion of two or more teeth, supplemental teeth in or out of alignment, aberrant teeth in or out of alignment, diminution in the number of teeth, the malposition of teeth, as well as the transposition of teeth, can be distinguished, one from the other, by the root cells. These cells will always reveal the character and position of the teeth that were implanted in them. Whatever may be revealed in the examination of the cells that inclosed the roots of missing teeth, the symbol for lost teeth will be used at the site of the missing tooth, on the diagram, thus X

If the cell or cells should reveal any of the abnormal conditions represented in the column of symbols, the appropriate symbol will be marked on the diagram in connection with the symbol for "lost teeth."

Where the roots of teeth remain in the process, the crowns having been lost during the life of the subject, their position will be indicated on the diagram by one small circle for each root or fang, thus . . . . .

Alveolar abscesses, or diseased antra of Highmore, leave cysts or bony cicatrices after death; these, when recognized, will be marked at the site of their occurrence, alveolar abscess, thus O

Diseased antrum, thus A

Inclusion of teeth within the process to be marked over the tooth or teeth, on the diagram, at the site of the inclusion, thus . . . . .

Lateral constriction of the maxillary bones, either single or double, and the degree of the constriction, can be shown on the diagram within the arch, by the following symbol . . . . .

The horizontality of teeth where they occur will be marked on the diagram at the site of their occurrence and the position in which they are found, thus . . . . .

The teeth which succeed the deciduous ones are sometimes im-

bricated (shingled) right and left or from the right to the left, and vice versa ; the symbol denoting this deformity will be used on the diagram in accordance with the position of the imbrication found, thus .....

A diastema or space sometimes occurs in the dental series in the region of the cuspid and bicuspid teeth of the superior and inferior maxillaries : where this is observed, the following symbol will be used at the site of the diastema on the diagram, thus =

Hypertrophy of the alveolar margins surrounding the necks of the teeth, presenting an irregular puffy border, is produced by the resistance of the living tissue to the encroachments of salivary calculi. This condition of the process will be represented on the diagram, thus .....

The presence of salivary calculi as to quantity, will be indicated by numerals on the table, from 1 to 4 ; the largest quantity present will be represented by figure 4.

Erosion of the enamel will be represented on the diagram, at the site of erosion, thus .....

#### SUGGESTIONS.

Prognathism (forward jaws) must not be confounded with anteversion or projection of the anterior teeth.

Orthognathism (right or straight jaws) in which the teeth upon occlusion are partly over, partly under, and partly on each other.

Isognathism, (equal jaws) "square bite"—in which the incisor teeth do not lap, but impinge on each other at their cutting edges, like the molars, so that when viewed along the surface of mastication almost a perfect plane is presented to the eye.

A deficiency in the thickness of the external plate of the alveoli, may be the cause of *anteversion* of the anterior or succedaneous teeth. This structural deficiency while concealed in the living may be revealed in the examination of the post mortem subject ; and redundancy in thickness of the external wall in the same region may be the cause of *retroversion*.

Asymetry of the dental arches by unequal growth, lateral crossing, atrophy of the jaws, right or left, mutilations and fractures of the teeth or jaws during life, will be recorded on the table under the head of remarks.

The value of the facial angle—facial axis—or craniofacial angle as a test for intellectual faculties is fallacious ; and while it may be



of some value as a character in comparing the different races of mankind, the different methods of measurement render investigation in this direction unadvisable ; it is therefore recommended that the facial angle, and the tests for brain capacity, be left to the craniologist until he establishes a rule of sufficient certainty to be of some practical value.

By far the largest number of prehistoric crania taken from graves or mounds, are so far decomposed that the calava is entirely gone while the maxillaries and teeth remain. The form of such crania, when obtained whole, are more or less distorted by the loss of tendon, cartilage, and the gelatine of the bone, and by the constant moisture and the pressure of the superimposed earth, rendering them totally unfit for anything like exact measurement, even when they can be recovered entire.

Aside from these considerations, the habit of carrying the child strapped to a board or flat piece of bark, the head being bound to the bark, produces a distortion or flattening of the occiput and a corresponding flattening of the whole cranium from the anterior to the posterior, so that the lateral diameter of many crania exceed the antero-posterior diameter. Prehistoric crania are very friable ; yet fifty years under a sandy soil is hardly sufficient time to deprive the bone of its gelatine. The period of burial is determined approximately by the condition of the bone, character of soil, etc.

Many crania, because they are taken from mounds, are supposed to be very old, and are labeled "Mound-builder's skull," which lends to the skull an air of great antiquity ; whereas there are few burial mounds that do not contain intrusive burials of very recent date.

There are no valid reasons for separating the so-called "Mound-builders" from the present race of Indians, seeing that we have the statements of the early European adventurers that the *American Indians when first observed were active mound-builders*. The worn condition of the teeth is no criterion by which to judge the age of the subject, but their general condition and development may serve for an approximation. There are no means of distinguishing sex in the human crania, except by the personal property always buried with the dead by savages at the time of interment, or by the recovery of the whole skeleton, when the size of the pelvis might be a close approximation. The majority of Indian crania are well pronounced male ; but many small and delicate crania are

exhumed with all the war implements of a brave, which were buried with them.

In regard to the "Inca-bone" (king-bone) being constant in the crania of the ancient Peruvians, or in the crania of the Incas of Peru, there is no knowledge. The sutures which commonly unite the parietal bones with the occipita sometimes fail to meet at the superior angle of the occipital, forming a space which frequently includes one or more wormian bones; these bones are sometimes very large, but they do not appear to be race characteristics, for they are found occasionally in the crania of all races.

Regarding the measurement of the dental arches—say the transverse measurement of the superior arch at the site of the first permanent molars and the depth of the palate at the median line of this measurement; there can be no object in such an investigation, excepting to show the futility of attempting to establish a typical dental arch or a model for a symmetrical dental series; for it has long been an established fact that the size of the teeth in human beings has no proportionate relation to the size of the body; very frequently, small persons have very large teeth, while persons of colossal size often have narrow and small teeth. Large persons usually have large jaws, but the teeth do not correspond to the size of the jaws as often as the jaws correspond to the size of the body, either in large or small persons. There are large jaws with small teeth, and small jaws with large teeth; the latter occur more frequently in small persons, while the former are of rare occurrence in large persons. It is utterly impossible to find a race or tribe of people, or even a family in which each member attains the same physical proportions.

As there appears to be a desire on the part of some to obtain measurements of the dental arch, separate diagrams will be furnished for that purpose, which must be returned with the books of tables and diagrams when the recording is completed.

The tables and instructions are bound in order that they be not separated, as they are designed for preservation in the archives of the American Dental Association, for future reference. After the tables are filled out and duly signed by the investigators, they must be returned to the Curator, without unnecessary delay, as the committee in charge of the investigation will make up their annual report from them. The tables with instructions can be obtained in book form, or the tables in single sheets, by addressing the Curator.

JOHN J. R. PATRICK, Belleville, Ill.,  
Curator of the Investigation.

## [FORM OF BLANK "A"]

*Information desired by the American Dental Association in regard to the Condition of the Teeth and Parts Adjacent in the Crania of Man, Prehistoric and Modern.*

## [CHART OF THE DENTURES.]

Race .....	Teeth missing where the process shows
Record No. ....	cicatrix. ....
Catalogue No. ....	Teeth lost from the process (post mor-
Supposed age. ....	tem) .....
Sex .....	Where roots remain, one small circle
Crania—	for each root. ....
Where	Cist or alveolar abscess. ....
obtained	Diseased antrum. ....
Occlu-	Inclusion of teeth within the process..
sion of	Constriction of the maxillary bones...
the Jaws	Horizontality of teeth, the circle to
	show direction of crown. ....
Condi-	Imbrication of succedaneous teeth...
tion of	Diastema, single or double. ....
Enamel.	Hypertrophy of alveolar border. ....
	Eroded enamel. ....
Salivary calculi. ....	REMARKS.
Rotation of a tooth on its axis. ....	.....
Partial division of the crowns of teeth.	.....
Supplemental or multiple tubercles...	.....
Crescentic enamel. ....	.....
Roots divergent. ....	.....
Roots convergent. ....	.....
Fusion of the roots of two teeth. ....	.....
Fusion with aberrant teeth. ....	.....
Confusion of two or more teeth. ....	.....
Malposition by transposition. ....	NAMES OF OBSERVERS.
Malposition outside or inside the arch.	P. O. Address. ....
Supplemental teeth outside or inside	P. O. Address. ....
the arch. ....	.....
Supplemental teeth in alignment. ....	P. O. Address. ....
Aberrant teeth marked at site of their	DATE AND PLACE OF EXAMINATION.
growth. ....	.....
Natural diminution in number of teeth.	.....
to be marked at the site of deficiency,	.....
thus. ....	.....

"IRREGULARITIES OF THE TEETH AND THEIR TREATMENT," by Eugene S. Talbot, M. D., D. D. S., etc., etc. Second edition, revised and enlarged, with two hundred and thirty-four illustrations, one hundred and sixty-nine of which are original. Philadelphia, P. Blakiston, Son & Co., 1012 Walnut St., 1890.



It must be granted that the supply is evidence of the demand in dental literature as in economics. The issue of the second edition of Dr. Talbot's book, after an interval of only two years, and notwithstanding the appearance of similar works by several other authors, is therefore an index of the sturdy growth and rapid development of this branch of dentistry.

The new book shows a marked improvement, both in the choice of matter and in the manner in which it is handled. It has an increase of one hundred pages and many illustrations, making two hundred and sixty-one pages in all. It is similar to the first edition in general appearance and excellence of the book-maker's art.

The subject matter is divided into two parts, namely, Etiology and Treatment. In this edition the anatomy of the maxillaries is omitted, the author having followed the suggestion of the REVIEW in its criticism of the first edition. The same fault, however, is again committed which was then pointed out—in not giving sufficient attention to the peridental membrane. Considerable space is profitably devoted to a description of the alveolar process; for the same reason so important a structure as the peridental membrane should be even more fully dealt with. Is it not through the offices of this tissue that all the changes of tooth position are accomplished? Dr. Black's exhaustive treatise,\* unfortunately but little known to the profession, might be made to furnish a chapter as indispensable as it would be novel to a work on orthodontia.

The close relations of the peridental membrane and the alveolar process, and the functional and structural changes they undergo when acted upon by a regulating appliance, should be clearly set forth.

Almost two-thirds of the book treats of constitutional causes. This is a very elaborate examination into an obscure subject. It is of great value as an able presentation of new facts, statistics of examinations of dentures, and authoritative opinions of other authors; but it must be confessed that the object sought still eludes Dr. Talbot. The postulate which he attempts to establish is, that irregularities of the teeth and jaws are due to malnutrition and defective nerve centers. His principal argument is that such abnormalities are markedly prevalent in the congenitally deficient

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\* The Peridental Membrane, by G. V. Black, M.D., D.D.S., W. T. Keener, publisher, 96 Washington St., Chicago.

classes—tables of the percentage of dental irregularities as found in the hereditary deaf, dumb, blind, insane and imbecile being offered as proof.

He also believes that the over-stimulation of the brain and nervous system, inseparable from a high civilization, produces irregularities in the teeth of the well-endowed individual. This is an application of the doubtful theory that a high civilization results in race deterioration. It will occur to many that the importance of local conditions and active causes in influencing dental irregularities is lost sight of in an exaggeration of constitutional causes.

As a contribution to true dental science, this book, by virtue of the part treating of etiology, is of great value to the profession, and unique. In so far as "it is intended to embrace all that is necessary to a clear and practical understanding of the treatment of dental irregularities," it is no better than its predecessor except in a few details; this is equivalent to saying that it falls far short of the aim. What the average practitioner needs (as well as the college student) is a book which will give him real practical help in any case which may come up.

The portion devoted to methods of treatment has but fifty out of two hundred and fifty-seven pages. It would add greatly to the usefulness of the book to have more cases cited, and appliances more minutely illustrated and their manufacture described.

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### MEMORANDA.

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Pyoktanin—pus-killer—microbicide, antiseptic. Get some.

Dr. C. F. Rich, of Saratoga, was a recent caller in the Garden City.

Never allow a pulp to get wet with water or saliva after you begin its destruction.

Prof. C. N. Pierce was at the Boston meeting in the interest of the *International*.

The Kansas City Dental College has 46 seniors and 60 juniors in its class of 1890-1.

It is unsafe to envelope a tooth with a cartridge, as it may explode, or the tooth may come out.

All of the dental societies of Chicago are now doing excellent work for the beginning of the winter.

The New England dentists are a fine looking body of men—all appearing as though they enjoyed out-of-door sports.

Edward A. Hicks, of Tabor, Iowa, a member of the senior class of Kansas City Dental College died of typhoid fever on September 28th.

Have you thought about drying root canals since our last issue? If not, commence some hard thinking at once, as too much moisture is fatal to a root filling.

The next meeting of the Northern Illinois Dental Society will be held at Elgin in October, 1891. Dr. M. L. Hanaford was elected President at the late meeting.

The logical and easy flowing sentences of the honored Professor—Brackett—might be studied to advantage by some of our western speakers greatly to their improvement in this direction.

Dr. C. T. Stockwell reminds one of the ancient deities, having the head of Æschylus and the piercing eye of an Alpine hunter, with an analytical mind second to none in the profession.

When you bleach a tooth with peroxide of hydrogen, wash the cavity first with ammonia, then use the peroxide by introducing it on cotton or lint with wood, bone or ivory tweezers or points.

The really eloquent speech of the whole New England meeting was made by our long-time friend and co-worker, Fillebrown, of Portland, when he presented the claims of the Dental Protective Association to the audience at Boston.

At Boston when a dental society convenes, all the gentlemen are present at the opening meeting, and they stay until the close of the session; which is more than can be said of many such meetings held in the West. A word to the wise, etc.

R. I. Pearson & Co., of Kansas City, have purchased the Alban Dental Depot, of Memphis, Tenn. The Memphis house will be under the management of Mr. Lee W. Dutró, formerly traveling representative of the Kansas City house.

The Massachusetts Board of Registration in Dentistry, appears to have been well selected judging from the genial manners of Drs. McLeod and Mitchell, two of its leading lights, to say naught of the President, Dr. Shepard, who has the energy and persistence of a regiment of dragoons.

Microscopy has got things down so fine that it is able to display in mastodonlike proportions the teeth of a mosquito. There are twenty-two of them, eleven each above and below at the front end of the creature's bill. Now, if science will devise a way to chloroform the mosquito and pull his twenty-two teeth, New Jersey will at once become a popular place of residence.—*Ex.*


At Boston the other day, a very scientific paper was to be read during the absence of the author; well, the way in which those dentists silently went out of the room into the lobbies and exhibition rooms was a warning to authors of papers to be present or have some one read the paper who could emphasize the points as they were read. From 300 the audience dwindled down to about 15 when the meeting adjourned.

Some one—one of the 90—*Archives* for November must have had a fit of indigestion lately, judging from the savage manner he pitches into the American Dental Association. We venture to suggest to the gentleman that there is no law against his doing a little work for the A. D. A. and thereby add to the strength



of the "Literary Bureau of the Home of the Presidents." Ohio has had the presidency seven times, Illinois five, Pennsylvania four, New York five, Missouri three, Indiana one, Kentucky one, Tennessee one, Maryland one, Massachusetts two, and there are centuries before us for presidential timber to spring from.

Are we manufacturers? As it was well spoken by Dr. Brackett, The dentists' work or services have no marketable value, except to the individual who seeks such service. Whatever he fabricates, be it crown, bridge, plate or filling, it cannot be bartered for in the public marts, hence it is not a manufactured product in any sense. Dentistry is now, as it has been for more than a century, an independent profession, which is gaining in public estimation year by year, even more rapidly than any specialty in medicine.

The porcelain inlay made by the gentleman from New Hampshire was unique in the method of fitting the inlay to the cavity. A few porcelain rods of different shades are cemented into a mandrel and they are ground down to a point—about like this  or larger, as may be desired. The cavity is cleaned and the walls are paralleled. The mandrel is placed in the engine, the point moistened and dipped in diamond dust or any cutting powder and it is revolved in the cavity until it fits nearly tight, which is ascertained by frequent examination. The point is then cut off nearly the right length and it is set with balsam or an oxyphosphate, and the projecting end is ground down and polished. It is very neat and effective, and looks well after finished.

#### DEATH FROM CHLOROFORM.

On last Monday Mrs. E. R. Sampson, of Spivey, went to the dental office of Dr. P. J. M. Burket, in this city, to have some teeth extracted. She asked to have chloroform administered, which was done in the presence of Mrs. Burket and Dr. Gooderl. It was administered to her in a paper cone, a cotton handkerchief having been saturated with the chloroform. The lady breathed but a few times after it was administered. Restoratives were immediately applied but to no purpose. Dr. Haskins was called, but on his arrival she was dead.—*Ex.*

#### DOCTORS AND DENTISTS OF MINNEAPOLIS—THEY VOTE TO CONTINUE THE MEDICAL AND DENTAL READING ROOM ANOTHER YEAR.

The committee in charge of the medical and dental reading room in the library, called a meeting Monday night and gave in their report for the year. Nearly 100 technical periodicals have been subscribed for with the \$335.30 raised last year; a balance of \$16, raised by the dentists, was voted to be used in procuring back numbers of dental magazines. While the use of the room had not been as general as might have been hoped, those present recognize the fact that such a collection of periodicals when needed would be invaluable, and it was accordingly voted to continue the enterprise another year; a tax of \$2 per capita to be collected from the physicians and \$1 from the dentists. A committee, which will take all steps necessary for the continuance and support of the reading room and to assist the librarian, was appointed, consisting of Drs. R. O. Beard, M. P. Vanderhorck, from the allopathic school; Drs. W. E. Leonard and P. M. Hall, homœopathists, and Drs. J. H. Martindale and A. W. French, dentists. The librarian also reported the expenditure of several hundred dollars by the city in procuring back files and for subscriptions to dental and medical publications.

## UNION DENTAL MEETING.

WHEREAS, It has transpired that the Census Bureau at Washington is engaged in the attempt to classify Dental Surgeons as manufacturers of artificial teeth, crowns and other mechanical devices.

AND WHEREAS, Great injustice to those really employed in this class of manufacturing would result to persons with invested capital in their business from such classification—

Therefore, be it resolved by the Fourteen Dental societies of New England in Union Convention assembled in the city of Boston—

That they protest against the action of the Census Bureau in thus endeavoring to classify Dental Surgeons as artisans, or manufacturers, when by no process of reasoning can their services as surgeons to a community be regarded as manufacturing commodities which have a marketable value as manufactured products.

And would further suggest that action be postponed until a conference can be held to investigate the matter more thoroughly.

Respectfully submitted,

L. D. SHEPARD	} Committee.
C. A. BRACKETT	
E. S. GAYLORD	

The resolutions were passed unanimously.

## THE VALUE OF PLATINUM AS AFFECTED BY ELECTRIC LIGHTS.

"No enterprise in the world," said a well-known electrician yesterday, "has increased within the last few years as rapidly as the business of electric lighting. The amount of money invested in electric light plants in this country to-day is \$120,000,000, and it was only eleven years ago, you remember, that the light was first perfected. From the few lamps burned by Edison at Menlo Park in 1879, there have grown into present use at least 125,000 arc lights and 1,700,000 incandescent lights.

"One of the most noticeable results of this remarkable growth is the increase in the price of platinum. Here is an incandescent lamp. You see the short strip of wire attached to the copper conductor just at the top of the globe. Well, that is platinum. It connects the carbonized loop, and is one of the absolutely indispensable features of the lamp, because it expands at the same temperature and in the same proportion as the glass globe. There have been a good many experiments for the purpose of determining a substitute for platinum, but none has been found, the experiments resulting, in each instance, in the unequal expansion of the metal and the glass, and the consequent breaking of the globe.

"Unfortunately every lamp requires a strip of this metal. I say 'unfortunately' because it has come to be extremely valuable, and the mines are not productive. Moreover, they are situated in the Ural Mountains and are practically inaccessible. As a result of this increasing demand and diminishing supply, the price of platinum has advanced tremendously, until it is now almost as valuable as gold. Five years ago the metal was seldom used in this country, being employed only in the evaporating stills for the concentration of sulphuric acid and in the manufacture of jewelry. It was then to be bought in the market for \$3 and \$5 an ounce. A year ago it advanced to \$8 an ounce, six months ago it had increased to \$14, and I see by one of the trade journals that it has now gone up to \$20, which is only a few cents less than to-day's gold quotations."

Platinum gets its name from the Spaniards. As early as the sixteenth century it appears to have been noticed that the gold ore in the Spanish mines of Darien included grains of a white metal endowed with the qualities of a noble metal, and yet distinctly different from silver. Its exportation to Europe was prohibited, because the Spanish Government found that it might easily be used in the adulteration of gold. For this reason it did not find its way to Europe until the middle of the last century, when it was known as "platina del Pinto"—the little silver from the River Pinto. Since its remarkable chemical properties were established in 1780, it has been discovered in New Grenada, San Domingo, California, Borneo, and in portions of Canada. But the richest deposits are those in the Ural Mountains, where the metal was discovered in 1823, and where it has been successfully mined by the Russians since 1828.—*Exchange*.

## ROOT DRYING.

BOSTON, Oct. 30, 1890.

MY DEAR MR. EDITOR :

SIR—In answer to your appeal in the October DENTAL REVIEW under the head of "Drying Root Canals," let me briefly outline my method. I have used for the past year, with unbounded success, a root dryer of my own conception. It is simple, cheap, and effective, being made of ordinary copper wire in 3 coils upon a metal point, cone socket or other, in a wooden handle and drawn out into a point. This instrument can be laid over the shield of the spirit lamp and the copper bulb heated as hot as desired. Previous to applying in the root canal it is my practice to apply some antiseptic oils to the canal and vaporize them with the dryer. A few applications of the dryer suffice to dry the root thoroughly and if gutta-percha is used for filling it will be found to work very easily and adhere to the hot sides of the canal, thus making a perfectly tight filling. Shall send you a sample this same mail.

Truly yours,

WILLIAM F. GAY, D. M. D.

*Directions for making :*

Anneal the copper wire thoroughly. Take an instrument of the desired size to hold the point, allow  $2\frac{1}{2}$  inches for the point and then coil around the instrument until desired size is reached, then coil back to the point again and then over again to the end. This end may be retained in place with a little silver solder. The copper point each time it is used is annealed and always remains flexible. New points can be made at a trifling expense or a new canal point soldered in when desired.

## MINNEAPOLIS DENTAL SOCIETY.

Programme of the Minneapolis Dental Society, 1890-91.

Officers and committees of the Minneapolis Dental Society: Dr. Edward H. Angle, President; Dr. A. W. French, Vice-President; Dr. F. H. Brimmer, Secretary; Dr. C. M. Colby, Treasurer.

Executive committee: Dr. J. H. Martindale, Chairman; Dr. M. G. Jenison; Dr. J. D. Jewett.

Membership committee: Dr. E. F. Clark, Chairman; Dr. H. L. Wilkins; Dr. L. D. Leonard.

Sept. 17th. President's address by Dr. Edward H. Angle.

Oct. 15th. Dr. L. D. Leonard. What constitutes a scientific mind. Opened by Dr. M. M. Frisselle, Dr. F. H. Brimmer.



Nov. 19th. Dr. F. H. Brimmer. Nervous reflect action; its relation to the teeth. Opened by Dr. W. P. Dickinson, Dr. W. X. Sudduth.

Dec. 17th. Dr. W. X. Sudduth. Teeth as evidence in the theory of evolution. Opened by Dr. Hugo Wangelin, Dr. L. D. Leonard, Dr. C. H. Stearns, Zumbrota.

Jan. 21st. Dr. W. P. Dickinson. Patient and Dentist, what each should reasonably expect of the other. Opened by Dr. C. M. Bailey, Dr. J. A. Parker, Dr. I. C. St. John.

Feb. 18th. Dr. E. F. Clark. Removable Bridges both Gold and Rubber. Opened by Dr. T. E. Weeks, Dr. H. A. Knight.

Mar. 18th. Dr. E. J. Morrison. Treatment of Pulp and Pulp canals. Opened by Dr. W. A. Spaulding, Dr. J. W. Penberthy, Dr. G. W. Avery.

Apr. 15th. Dr. H. A. Knight. Uses of Amalgam. Opened by Dr. W. N. Murray, Dr. E. J. Morrison, Dr. C. Strachauer.

May 20th. Dr. J. A. Parker. Comparative value of the Bridge as a substitute for the Natural Teeth. Opened by Dr. E. F. Clark, Dr. H. B. Tillotson.

Reserved Papers. Dr. M. M. Frisselle. "What constitutes a Medical Specialist." Dr. W. X. Sudduth. Illustrated Lecture—Subject to be announced later. Dr. J. H. Martindale. "Laws Regulating the Practice of Dentistry,—Their efficiency in promoting Public Welfare and Professional Advancement."

#### TOO MODEST BY HALF.

Dr. C. L. Hungerford, the genial and accomplished Associate Editor of the *Western Dental Journal*, is nothing if not modest, as evidenced by the September number of his Journal, wherein he reprints from the *Archives* a speech by Dr. Theo. Stanley, delivered at a banquet of the Missouri State Association, but modestly refrains from reproducing one delivered by himself which, while we would not detract from the merits of the many others, we consider by far the best one published; in fact, it is, to our mind, one of the neatest and most fitting responses to that ever present and popular toast "The Ladies" that we have read in years, and we take pleasure in presenting it to our readers just as it appears in the *Archives*:

DR. FISHER:—Our seventh toast is,

#### THE LADIES.

This toast will be responded to by our handsome bachelor friend from Kansas City, Dr. Charles L. Hungerford.

DR. HUNGERFORD:—*Mr. Toast-master*—I regret that I lack those acute powers of discernment and the analytical mind that enables the scientist and philosopher to pick to pieces the complex organizations of nature, for, did I possess them, being as I am, neither a cynic, a misanthrope nor a lover, nothing would give me greater pleasure than to hold up to your expectant gaze, that bundle of contradictions, nature's sweet paradox, a woman. From time immemorial woman has been to us a Chinese puzzle, the source of our unrest.

"While Adam slept, from him his Eve arose:

Strange, that his first sleep should have been his last repose."

Even to the saints woman has been an allurements and a snare, the daintiest morsel ever used by the seducer of souls to trap unwary man.

"What bait do you use, said a saint to the devil,  
When you fish where the souls of men abound?  
Well, for special tastes, said the King of Evil,  
Gold and fame are the best I've found;  
But for general use? pursued the saint,  
Ah! then I fish for man, not men;  
And a thing I hate, is to change my bait,  
So I fish with a woman the whole year 'round."

So, Mr. Toast-master, since I cannot solve, dissolve nor "mash" her, it only remains for me to pledge her, who was first at the trial of the Master, as she is also first in our love, first in esteem and

first in our dreams of heaven. I would like to respond to this toast in words that would live when I am gone, but I cannot do so; I can only say, I would pledge an earnest tribute to her grandeur of character, her loving gentleness, her tender solicitude, and her loyal affection for, too often, unworthy man. I would pledge to her, in liquid as clear as her intuitions, as bright and sparkling as her eyes, as cheering as her consolation, as strong as her sustaining comfort in adversity and sorrow. I would pledge to her that she might ever remain a queen in the empire she has so royally won, grounded deep as the universe on love; built up and exercised in the homes of the entire world. I would pledge to her the full-blown flower of creation's morning, of which man was but the bud and blossom; to her, who in childhood clasps our hands and teaches us our first sweet prayer; who comes to us in youth with loving counsel and advice; who in manhood meets our heart longings (with the truest love), and whose hand, when our feet go down into the vale of shadow, smooths the rough pillow of death as none other can; to her, who is the flower of flowers, the pearl of pearls, God's last, best and brightest gift to man—woman, pure, peerless, royal woman!

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## OBITUARY.

### DR. JOSEPH DESCHAUER.

One of the oldest dentists and pioneers of Chicago passed away, when the subject of this sketch died at his home, 507 La Salle Avenue, Chicago, October 21st, 1890, at 40 minutes after 6 o'clock in the evening.

#### DEATH OF DR. DESCHAUER.

Dr. Joseph Deschauer, one of the pioneers of this city, died at his residence, 507 La Salle Avenue, last evening. Dr. Deschauer was born February 18, 1822, in Eger, Austria; went to the public schools of that place until 14 years of age, passing through the High School; he then entered the Polytechnic University, from which he graduated in his 17th year. He then began the study of dentistry studying in Germany, Switzerland and Austria. He practiced for a time in Vienna, but at the time of the Revolution, in 1848, he was compelled to leave that city, establishing himself in his native city, Eger, where he continued to practice until he came to Chicago in 1856, where he had since resided. At the great fire he lost what he had accumulated, but has since then again acquired a fortune. He was one of the first dentists in the city, which profession he practiced till three years ago, when he retired. He leaves behind him a wife comfortably situated, and a daughter married to Dr. George A. Christmann. Dr. Deschauer was a Free Mason and leaves a large number of warm friends to mourn his loss.

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### DR. C. W. LEWIS.

C. W. Lewis, D.D.S., of Chicago, died October 21, 1890, of consumption, at Denver, Colorado, whither he had gone in search of health.

Dr. Lewis was born in Syracuse, N. Y., on the 29th of October, 1860. His boyhood was passed in going to school and working on a farm near that city. He first studied dentistry in the office of Dr. Wescott, of Syracuse, by whom he was employed for several years. He next came West and was for a short time with Dr. W. A. Stevens, of Chicago. He was a graduate of the Chicago College of Dental Surgery, class of '84, having engaged in practice a year prior to that time. The last few years of his life have been very busy ones. So busy, in fact, that in some degree they have been the means of his untimely death. Dr. Lewis was the principle witness in establishing the identity of Dr. Cronin's body.

His remains were taken to Syracuse for interment, and the funeral ceremony was held on Sunday, October 26th, 1890.

# THE DENTAL REVIEW.

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VOL. IV.

CHICAGO, DECEMBER 15, 1890.

No. 12.

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## ORIGINAL COMMUNICATIONS.

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### THE DENTAL PULP. ITS DESTRUCTION AND METHODS OF TREATMENT OF TEETH DISCOLORED BY ITS RETENTION IN THE PULP CHAMBER OR CANALS.\*

BY A. W. HARLAN, M. D., D. D. S. CHICAGO, ILL.

The destruction of the dental pulp in a permanent tooth is a foregone conclusion after a loss of a portion of its substance, by exposure, or it has been long irritated or inflamed and congested, from near or total exposure to external agencies. This general statement may be made with a few minor exceptions, as for example, after the fracture of a tooth where a portion of the crown is lost by accident, or the exposure of a pulp in an incompletely developed tooth, in such cases attempts should be made to preserve its vitality, as well as in all cases where it may be accidentally uncovered in excavating a cavity. Otherwise than these exceptions the general rule may be as stated above. How shall the pulp of a tooth be destroyed? Prior to 1836 the method in vogue was heroic, *i. e.*, forcible removal with a broach or other instrument or the application of the actual cautery. From the time of the discovery of the fact that arsenic might be used (S. Spooner), up to the present day, it has had more adherents than any or all other drugs or methods combined. To-day it is supreme in this respect and there are few who advocate the use of any other drug or drugs or mechanical methods for effecting its death. There is a growing belief that the production of general anæsthesia is favorable to the complete removal of the pulp. This is practiced by a few with

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\* Read before the Union Dental Meeting, Boston, October, 1890.



nitrous oxide, but on account of the fact that the pulp chamber or canals may be contaminated by saliva, or other accidental agents which may gain access to the tooth, renders it improbable of general adoption by even a minority of dentists. The general desire evinced by the majority of dentists to work under antiseptic precautions precludes the possibility of this practice becoming general. Lately, that is in the past few years, the method of driving it out of the root by medicated wood, cedar, hickory or orange wood dipped in carbolic acid, has been adopted by a few dentists here and there, but the practice has not become universal. There are reasons why this is so. First, shock, the ultimate results of which cannot be foreseen or estimated is one of the attendant circumstances of this method which even partial anæsthesia cannot prevent.

I have practiced this operation in a number of cases, and unless the cases are selected with great care, the results are not satisfactory. The impression produced on the mind of the patient is ineradicable should even a slight degree of pain be felt. In addition to this the method as a method lacks completeness, because it is inapplicable in many cases where the operator most desires to practice it; this is a fatal defect. Moreover, the plan of procedure has other and more serious defects, viewed from the standpoint of future beauty and usefulness of teeth so operated upon. To my mind, the mere fact of the wooden point being of necessity dipped in carbolic acid, undoes, at a moment's notice, the object of root-filling as a measure of the prevention of future pericemental irritation. The fact will be granted for the sake of argument, that carbolic acid anæsthetizes the pulp, that the wooden point will mechanically remove it and that the coagulation of serum is perfect at the apex of the tooth, and further, that the point may be reintroduced to serve as a root filling or a new one be substituted for this purpose. All this we grant, and we go so far as to say that there may no trouble ensue from the immediate filling of the root after this method; but all this will not prevent future discoloration of the crown, even though the cavity of decay be perfectly filled with gold. Perhaps you may ask how I know this? Or you may say this remains to be proven. I will tell you why I know this. All soft tissues, coagulated, are either transformed into calcific or corneous bodies or are exfoliated by virtue of the vitality of the underlying living tissues, resulting from the changing functions of the

immediately subjacent layer of cells, or such coagulated bodies immediately become the prey of the anaerobic microbes present and in due course are completely destroyed by them and appropriated as food for their sustention. During this process of destruction of a coagulated body, sulphuretted and phosphoretted hydrogen is slowly evolved, which must of necessity have an outlet.

At first these gases may pass through the apical foramen of the tooth if it offers the least resistance, but more frequently they permeate the dentine which has been deprived of the bulk of its animal matter by the destructive activity of the microbes present, which are not dependent on the presence of oxygen for the maintenance of their existence, and slowly but imperceptibly at first that portion of dentine which is thus excavated is filled with these mephitic gases until the dentine, not alone of the root but of the crown also, is thoroughly permeated, causing the crown of the tooth to become discolored. At first it is opaque; then slightly yellow, later bluish, and finally brownish or bluish-black. During the period of infiltration there may be slight tenderness of the tooth to pressure; it may appear perceptibly longer and finally, unless encystment of the apex of the root supervenes a permanent lameness of the tooth takes place, which does not disappear. If the possessor be a person of robust health this may not occur for some years, possibly five or even ten, but it is the inevitable result of the permanent retention of a coagulant in the root of a tooth as the accompaniment of, or ingredient of a root filling. The final result to the patient is first a discolored tooth, second a low form of irritation of the cementum and pericementum, impairing their vitality, and later the production of a blind abscess, which may be likened to a smouldering volcano, or the establishment of an abscess with a fistulous outlet which is a source of permanent discomfort to the patient, and which if relieved at all must be done radically; that is by the removal of the filling, including the wooden point (not always easy of accomplishment), the curing of the abscess, refilling the root and worst of all the restoration of color, or whitening at least, of the crown of the tooth and the refilling of the original cavity—made much larger by the above series of disasters.

In considering this subject, it may be well to state that the dentine of a tooth may acquire added discoloration if any red blood corpuscles are allowed to remain in the root or are adherent to the wooden plug. Should the wooden stick be in any sense an

incomplete root filling there may result in a short period an abscess of the acute variety, which nullifies the whole operation. Another and not an infrequent accompaniment of this method of operating on the dental pulp, is the production of exostosis, which may cause the absolute loss of the tooth. Viewed in any sense this heroic method of removing the pulp, using a coagulant to bathe the interior of the root, or to dip the wood, lead, zylonite, whalebone or other material used as the root filling, is unphilosophical, and there is no reason for its employment unless complete desiccation of the root is obtained, and the root is filled on strictly mechanical principles, or the substance which enters the root is a non-coagulant. Much, if not the whole, discoloration of a tooth may be prevented as follows: When the pulp is to be destroyed, the cavity of decay should be bathed or syringed with warm water, 110° F to 130° F. The crown, if there be sharp corners, should be trimmed with chisels, or in any way most familiar to the operator. A little square of rubber dam, two inches or thereabouts, should be slipped over the tooth and the one adjacent (if it be present) and the pulp is then exposed, and vinum opii or any anodyne applied (not carbolic acid) for a minute or two. After which use the following:

R Acidi Arseniosi, 3 i

Hydrochlorate of cocaine, 3ij

Lanolin ad. q. s. to make a stiff paste.

A small quantity should be applied directly to the exposure on a little square of gummed paper about  $\frac{1}{16}$  of an inch in size. This should be covered with a pellet of cotton dipped in liquid vaseline and the cavity is then to be stopped with soft gutta-percha, or if there be time enough a paste of oxyphosphate of zinc may be used. If the patient is an adult (more than 21 years of age) the arsenical application should remain 48 hours. If under that age and more than 12 years 24 hours, under 12 years 8 to 12 hours is long enough. When the patient returns at the appointed time the little square of rubber-dam is reapplied and the dressing removed, water and saliva must be excluded from the tooth. Nothing should be placed therein unless the operator uses it himself. Apply to the cavity immediately a pellet of cotton saturated with dialysed iron to antidote any arsenic adherent to the pulp or the cavity of decay. The first thing to be done then and there is to puncture the pulp with a fine sharp-pointed instrument. A little blood will escape which is carefully wiped out. Apply some peroxide of hydrogen



on cotton with nickel-plated, platinum or gold pliers until the blood is destroyed. Gently wipe the cavity with oil of cassia, absorb the excess with paper or lint and then apply directly to the pulp a square of paper fiber-lint, wet with a saturated solution of tannin in glycerine, cover this with gutta-percha, or if the pulp appears to be still sensitive, apply at the same time a pellet of cotton saturated with myrtol, then seal the cavity with gutta-percha, and make two perforations through it with a pointed instrument not larger than an ordinary steel or brass pin. Dismiss the patient for eight days.

At that time everything is favorable for the complete removal of the pulp. Extravasation of blood in the pulp cannot occur after the application of tannin. The blood disks are held intact and in consequence of the avidity for water possessed by glycerine and tannin, it is all extracted from the pulp—which presents itself as a shrivelled desiccated body easy of removal at this time. On account of the concretion of the pulp which has really been tanned, there is little or no difficulty in its complete removal. There will be no hemorrhage, because a separation of the dead portion from the living will have taken place. On account of the concretion, due to abstraction of the serous portion of the pulp, it will be tough and elastic. It may be removed entire from the root or roots and immediate root filling may be practiced. Before this is attempted the following precautions must be observed: No water or saliva should be allowed to gain access to the pulp chamber or canals, as this would be fatal to the maintenance of the color of the tooth. Complete desiccation of the canals should be undertaken because on its faithful performance the future stability of the tooth depends. This may be accomplished in several ways. First, heat from an electric or other cautery. The Evans or Woolley root dryers may be used. Second, by the rapid evaporation of chloroform. Third, by the use of boro-glycerine or aqua-ammonia and Fourth, by using absolute alcohol to excess, that is by filling the pulp chamber and canals with absolute alcohol and dissipating it with hot blasts from a syringe and repeating this until absolute dryness is secured. When this is accomplished filling of the root at the same sitting is indicated; nothing will be gained by deferring this operation. Filling of the root is made possible in the following manner: Eucalyptol is introduced into the root on cotton or otherwise and after the excess is absorbed with paper cones, a creamy solution of

gutta-percha in chloroform is pumped into the root or roots until they appear to be well filled. Then slender cones of gutta-percha are introduced into the root by heating a fine broach which is thrust into the large end of the cone and carried directly to the apex, displacing the solution of gutta-percha and filling all interstices or foramina which may have been unnoticed.\*

The object in first using the eucalyptol is to facilitate the diffusion of the gutta-percha as it is a solvent for it and it permits the complete filling of the root. It will be noted that no coagulants are used in this final treatment of the root made pulpless by the first application of arsenical paste. This paste is so composed that absorption of the arsenic is assured at once, as lanolin is known to be the agent which more easily facilitates absorption than any other known agent, unless it be chloroform—which cannot be used on account of its volatility. Although it may seem tedious to follow me, it will be found by this method of treatment of the dental pulp no portion of its substance is allowed to remain in the tooth to be decomposed and discolor the dentine or enamel. The usual methods of removal of the pulp, including its destruction are to say the least faulty. There is a hap-hazard sort of hit or miss about the prevalent practice which is inexact but disastrous, but to which many practitioners are wedded by long years of routine. The practice which I present to you to-day is based on a study of the subject of prevention of discoloration of teeth by an exact method of treatment of the dental pulp from the time it is doomed to destruction until the root is filled. Failure to observe any of the precautions laid down in this treatise will be considered cause sufficient for failure. There is no possibility of those peridental disturbances previously mentioned, occurring, if the details are followed with accuracy, for the following reasons:

First. Rupture of the blood disks will not occur when tannin is placed in contact with them. Second. The bulk of the pulp is reduced by the actual contact of tannin and glycerine with it, due to the abstraction of water. Third. It is concreted and rendered coherent by this treatment; in fact it is tanned. Fourth. There is

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\*The writer speaks dogmatically on this subject, but he is not unmindful that there are other meritorious methods of pulp treatment, pulp destruction, and pulp-canal filling. The methods here spoken of are intended to be complete in themselves—simply a system to be followed as a whole—for beginners as well as older practitioners.

no hemorrhage after its removal, because it is separated from living parts in a perfectly physiological manner, as is noted in the separation of an eschar from an open wound. Fifth. The root may be filled at once as there is no irritation at the apex. Sixth. The whole process of treatment from the initial steps are aseptic, hence the tooth and its surroundings are in the best possible condition for the completion of the operation by filling the roots. Seventh. The process of filling and the manner of its accomplishment precludes the idea that there can be any subsequent discoloration or destruction of the animal matrix of the tooth as there is no coagulated body or its analogue to be destroyed by anaerobic microbes or permit the evolution of mephitic gases on which the future discoloration of a tooth depends. The complete discoloration of the substance of the dentine depends on the retention of blood or a portion of the pulp within the pulp chamber or canals, or the use of coagulating agents following the incomplete removal of the pulp. Much of the discoloration of teeth depends also on the fact that dentists will not exclude water and saliva from pulpless teeth. The usual methods, as you well know, are to apply arsenic or an anæsthetic, and after the removal of the drug, allow the mixed fluids of the mouth to enter the pulp chamber or canals. Water is one of the worst agents which comes in contact with a dead pulp as the coloring matter of the blood is abstracted by its presence; hence you will see the necessity for excluding it from a pulpless tooth when you have destroyed it yourself.

I assume that more pulps of teeth are destroyed by dentists, than die spontaneously or by general exposure. If this is not true, it is true that dentists fill more teeth where they destroy the pulp, than they fill of those which come to them to be filled after pulp-death by other agencies or causes. It is on this account that I beg of you to adopt a method of destruction of the pulp which will least endanger the future discoloration of the visible crown. Nothing is so unsightly as a discolored tooth exposed to view. It lies with you as teachers and operators, to prevent this wholesale disfigurement of the human face, by changing your usual modes of practice and adopting one that will give the minimum of unsightly teeth instead of the maximum, so enormous that at least 15 per cent of those persons operated upon by dentists give evidence every time their mouths are opened, that they are victims of a routine practice which has no excuse for its further continuance.



## BLEACHING TEETH.

In continuation of this subject we are compelled to adopt some means of restoring to presentableness, teeth already discolored by barbaric methods or blackened by accident. It matters not what the original cause may have been, there are teeth to be whitened and made less hideous to the beholder. At this time I cannot review all the methods of bleaching or whitening, but will present for your consideration a few observations deduced from a study of the whole subject.

One method of bleaching teeth which has not received the attention it deserves is the following: Method No. 1. The root having previously been filled, all decay is removed from the cavity, and it is thoroughly washed with aqua calcis. A freshly prepared solution of chloride of lime is placed in the tooth and this is in turn gently touched here and there with a dilute solution of sulphuric acid, less than three per cent of acidum sulphuricum dilutum. This will liberate the chlorine, which will bleach the exposed discolored dentine. Rewash the cavity with lime water and repeat the process as before, when it will generally be found that the tooth is satisfactorily bleached. The theory of this process is that the coloring matter is so altered as to become soluble in the alkaline lime water and the bleaching is complete. Carbonic or tartaric acids may be substituted for sulphuric by this process.

Method No. 2. The cavity in the tooth having been freed of grease, serum and decay, is washed in a dilute solution of soda. Freshly dried aluminum chloride is placed in the cavity and Labarraque's solution of chlorinated soda is introduced on cotton with a pair of platinum, wooden or gold tweezers. The chlorine is liberated and the coloring matters are thereby rendered soluble in a solution of carbonate of soda, which may be used to wash the cavity.

Method No. 3. Wash the cavity with a solution of biborate of soda, introduce dried aluminum chloride and add freshly prepared, or at least a freshly opened, quantity of hydrogen peroxide. In a short time, three or four minutes, the bleaching will be effected by the decomposition of the  $Al_2 Cl_6$  in the tooth and the coloring matter having been rendered soluble in solution of carbonate of soda, may be washed out and this process is complete. Method No. 4. After cleansing the cavity and removing all visible decay, wash it well with a solution of barium hydrate, then place powdered alum

in the cavity and add a solution of chlorinated soda, which will completely decompose the alum and, after the bleaching is effected the cavity must be thoroughly washed with a solution of sodium carbonate and dried. Method No. 5. [There are a number of processes of bleaching not here mentioned which may be found in current journalistic literature, to which the reader is referred. The reaction of the different processes might have been written out but it was thought to be unnecessary for the purpose of this paper]. A freshly prepared solution of sodium hypophosphite is introduced into the tooth and a jet of carbonic acid is directed on it for a few minutes when the tooth will be found to have attained its original color. The cavity must then be washed with an alkaline solution and dried. It would not be profitable to further dilate on this interesting subject, but you will permit me to offer the following suggestions:

1. The root must be filled before the bleaching process is begun.
2. The rubber dam must be used.
3. Ordinary hydrant water, rain water or even distilled water must be kept out of the tooth.
4. Steel or iron instruments must not be used.
5. After the bleaching is done oxychloride of zinc of the proper color should be introduced at once.
6. When this is well hardened the gold filling must be made immediately.
7. If the labial wall of a tooth has only the enamel remaining, the interior of the cavity must be varnished with copal-ether varnish, with a bleached brush and pure white glazed paper of suitable size is carefully packed against the labial wall. The paper must not be creased or folded. The above and other precautions are to be observed in the bleaching of teeth in order to secure a satisfactory result. I can assure you that it is often a tedious and trying operation when followed with the minutest detail and persevering faithfulness, but success is assured when all details are followed.

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#### SURGICAL CLINIC.

OPERATION PERFORMED ON DISEASED ANTRUM BY DR. T. W. BROPHY, BEFORE SENIOR CLASS OF CHICAGO COLLEGE OF DENTAL SURGERY.

REPORTED BY C. E. BENTLEY, D. D. S., CHICAGO.

GENTLEMEN: The patient before us gives outlines of symptoms that justify us in the suspicion that he has a diseased antrum.

He complains of a "dripping of pus through the nose." Of pain, neuralgic in nature, in the region of the eye, temple and

teeth of affected side, and general discomfort in region of antrum. The antrum of Highmore or maxillary sinus is a triangular-shaped cavity, with its apex directed toward the malar process and having as its base the outer wall of the nose. The alveolar process forms its floor, while the orbital plate furnishes the roof for this cavity. In its articulating with the middle meatus of the nasal fossæ a small opening exists which often aids the surgeon in his diagnosis. The size of this cavity varies in different individuals. It is lined throughout with mucous membrane, and arising from its floor in many cases, are numerous septa of bone partitioning the cavity into separate cells. The causes of disease in this cavity are such as aggravated catarrh of nasal passages, where, by the continuity of the mucous membrane, the membrane lining the antrum may become affected. Such cases are rare, however.

A blow in the region of the antrum may produce antral trouble.

The teeth are by far the most frequent cause of disease of this cavity. Not infrequently the roots of teeth penetrate the antrum. You can readily see that if such teeth become abscessed they pour their putrid excreta into the antrum, thereby giving rise to more or less serious trouble. The pus from abscessed teeth, whose apices rest upon the floor of the antrum, often takes an upward course and penetrates the floor of the cavity. Pus once in the antrum with no outlet, soon lights up a fire that often proves difficult to extinguish.

There are several positive diagnostic symptoms in a diseased antrum.

If there be pus to any considerable degree, if the patient when in bed will suddenly turn on the unaffected side the pus is liable to make its way through the nasal opening at its base. Often the patient complains of the elevation of the orbital plate and distress in the eye. Dull and reflected pains in and about face and head occur. Percussion on the antrum will often give important information whether the cavity be empty or full. The electric lamp within the mouth in a dark room will reveal opacity on the affected side while on the unaffected it is translucent.

The treatment is to open into the antrum at its most dependent portion. This can usually be obtained by penetrating between the first and second molar teeth or the extraction of the second molar.

In the case at hand the patient has had the second molar extracted and we shall proceed to secure entrance at that point.



Having obtained entrance, we discover that only a small quantity of pus escaped and are led to conclude that more pus is retained within the cavity by the septa of bone which imprisons the pus and thus prevents its escape and averts free drainage. Our duty then is plain. We must break down the remaining septa, and to facilitate that portion of the operation we make a free opening through the alveolus and with a chisel remove the partitions of bone that remain. We now see upon the removal of these bony partitions that the pus flows freely into the mouth and we can be assured of good drainage. The after treatment consists in inserting a platinum drainage tube, to which is attached a platinum band which can be fitted to a neighboring tooth. The length of this tube should be the distance from the floor of the cavity to the external opening, being careful not to get it too short or too long. If too long it proves an irritant to the part and does not perfectly drain the cavity, if too short it soon fills with the tissues at the upper end and thus becomes stopped. The physician who brought this gentleman to us for treatment will attend to the further needs as the case may demand.

#### AMPUTATION OF THE ROOT, CENTRAL INCISOR.

GENTLEMEN:—The patient before you has for years suffered from chronic alveolar abscess, located upon the apex of the right superior incisor. Chronic alveolar abscesses are often of such long standing and offer such resistance to treatment that the integrity of the tooth and surrounding parts are often impaired, and surgical treatment is necessary to effect a cure of associate parts and save the tooth.

You are familiar with the various causes that produce this condition, and I need not dwell upon this phase of the subject.

This gentleman comes to us for treatment. What shall we do for him? Upon examination we find a sinus leading from the gums on labial surface to and beyond the apex of the root. Further examination reveals that caries of the alveolar process has occurred and we deem it advisable to amputate the root and remove the affected bone surrounding it.

This is a typical case of caries of the bone and differs from necrosis in that caries is a molecular destruction of bone, while necrosis is death *en masse*. By injecting a few minims of a 4 per cent solution of hydrochlorate of cocaine, it will obtund the

pain incident to the penetration of the gums and periosteum. Now, with a rapidly revolving bur of this shape (exhibiting flame shaped bur), by penetrating gum and alveolar process, we strike the root at a proper distance below the diseased part and amputate the root. Our second consideration in this case now, is to remove the carious bone about the affected tooth. With a large round rapidly revolving bur I will remove the affected bone. Having completed this part of the operation we now proceed to stop the hemorrhage and syringe the parts with a weak solution of carbolyzed water. The after treatment in this case closely adheres to the principles of antiseptic surgery. After thoroughly cleansing the wound we pack the newly made cavity with boracic acid gauze. It is good practice to fill the root at this sitting, as the opening made by burs will afford ample space for one to see when and how the root is filled. On removing it the next day we may make an ocular examination of the parts when the healing process begins, by softening a piece of wax, and gently pressing it into the opening and shaving it at the orifice you can get an impression of the parts which, as the healing process continues, can be trimmed from time to time until the opening has been completely filled with new granulating tissue, thus preventing the wound from healing at its mouth before its base is filled with new tissue.

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#### IS THE COMBINATION OF TIN AND GOLD A VALUABLE ADJUNCT IN PRACTICE.

BY GEO. A. MILLS, D. D. S., NEW YORK.

Such a question should receive an intelligent reply, based upon intelligent experience.

And I am not able to understand why it should not be so answered. It is not a new subject. Were it not that we have so many inexperienced practitioners, it might not seem so important. But we must not forget that the voluminous reports which are appearing in our several journals—dependent and independent—are very largely perused by the incoming generation of practitioners, and the age in which we are living is an inquiring one. So it is becoming a practitioner of experience to say what he means, and to mean what he says. Is this a fact?

There are two classes of men that have been and are discussing

the question of the value of the combination of tin and gold as an adjunct in practice.

The intelligent advocates number such men as the late Dr. Abbott, of Berlin, Germany, and Dr. Jenkins, of Dresden, Saxony. I will only mention these two, not that there are no more, but because these men as advocates I deem quite sufficient to secure reasonable attention and this will be accepted without question. "Why?" some may ask. On the same principle that twice two makes four. No one but a once crazy man has ever doubted this. Why? Because it is demonstrated day after day. Then on this basis these practitioners are not obscure men; they have been widely known for many years, and known particularly in this wise, by their works. So we know men. This makes their testimony of value. Scores who have never seen these men have seen their work and pronounced it well done. They have seen the stamp of thoroughness as they have observed their operations of course largely in the teeth, of the bettered condition following the circumstances of their favored position in large foreign centers.

I say this without fear of dispute from any quarter that will weigh, that these men alone, if there were no others to sustain the practice—have demonstrated beyond dispute that the combination of tin and gold is a valuable adjunct in practice. It does not follow that because some other men emphasize that they have disproved the fact that they have. The demonstrations of these men that so many are familiar with stand uncontradicted. When a thing is proved it is a waste of time and energy to try and disprove it. These articles combined or not, are in common with the entire list of materials for filling. I like better to say materials for saving teeth. I say all these are of great value, but they all have their place and circumstances for use, and if we will digest the true meaning of the remark so tritely made by Dr. Miller published in the August number of the *Mirror*, page 18—"The trouble seems to have been that in America men have not known how to differentiate as to the best locations in which to use tin and gold."

It took many a man a long time to get through his intelligence the truth of that saying of our noble Apostle of Plastics, "The tooth that most needs saving, gold is the worst material." As Dr. S. G. Perry, of New York, says, "It is only horse sense!" Dr. Flagg, "Bearded the lions in their dens," and it could not be expected in the nature of things that they would at once look com-



placently on him or even to take the trouble to try to understand what he did mean. Who does not use plastics more for that New Departure?

So I say to all inexperienced practioners prove all things, hold fast to that which proves good, and remember, if perchance some one denies what recognized intelligence has proved good, study to find the cause of the proof.

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PRESIDENT'S ADDRESS.\*

BY DR. J. W. WALLACE, LOUISVILLE, KY.

At the close of a year fraught with more gratifying results to the members of our profession than any like period in the history of American dentistry, I deem it a high honor that you have seen fit to bestow upon me the privilege of extending to one and all a hearty welcome on this the occasion of our Thirtieth Annual Meeting. We have convened for the purpose of mutually reviewing the history of our profession during the past year and thus glean from its pages all that is calculated to inspire us to a more earnest effort for the advancement of our chosen profession and the well-being of a confiding public. This is a work in which the young and old are alike interested, and it is pleasant for both to now and then go back to the very beginning of dentistry in the United States and note the rapid progress made in the science in so short a time. From the earliest history of our profession in this country to the present its march has ever been onward and upward, and there is not a profession in this fair land of ours, the progress of which will in any way compare with that which has been witnessed in our specialty. The early history of American dentistry, though meager and imperfect it may be, begins at a very recent date. We only have to go back to the year 1766 to see our profession in its real infancy with only one practitioner. We may say that was the beginning. In October of the year above mentioned, one Mr. John Woofendale of England, reached our shore and commenced practice in New York soon after he arrived; he also practiced in Philadelphia, but from some unexplained cause he returned to England in March, 1768, (perhaps it was for a lack of territory or competition). From the time when Mr. Woofendale

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\* Read before the Kentucky State Dental Association, 1890.

returned to England until some years after the Declaration of Independence, there was not, so far as can be discovered, a regularly practicing dentist in this country. "Josiah Flagg, who was the first dentist native to this country, began to practice immediately after the close of the war in 1782."

The following extract from a circular which Flagg was wont to distribute, will show us how dentistry was introduced as a mere trade and not as a science: "Dr. Flagg transplants teeth; cures ulcers and eases them from pain without drawing; fastens those that are loose; mends teeth with foil or gold to be as lasting and useful as the sound teeth and *without pain in the operation*; makes artificial teeth and secures them in an *independent, lasting and serviceable manner*, sews up harelips and fixes gold roofs and palates, greatly assisting the pronunciation and the swallow. Cuts the defect from the teeth and restores them to whiteness and soundness without saws, files, acids and such abusives as have shamefully crept into the profession and which have destroyed the confidence of the public; sells by wholesale and retail, dentifrices, tinctures, chew-sticks, masticks, teeth and gum-brushes suitable for every age, complaint and climate, with directions for their use."

From the above we may learn that men in those days presented their claims to the public as they practiced, according to their own energy and genius. At that time there was no code of ethics to be violated, and dentistry was looked upon by all as a trade and not a profession. When every man practiced with closed doors according to his own ingenuity, and for his own good. In proof of this we only have to refer to the labors of some of the best men in the profession during its early history, and we will find their efforts were in the direction of a higher standard in their calling. Men of more liberal minds were prompted by the high motive that by helping others they would help themselves, and would elevate our profession from the position of a trade to that of a science, which it so honorably occupies to-day. If we read the history of their labors, we will find by a united effort the American Society of Dental Surgeons was organized in 1840 (the first society of dentists in the United States). On that occasion Dr. C. A. Harris, whose name is immortal, offered a resolution directing the drafting of the Constitution, which indicates the high motives that prompted him. Article I. of the Constitution as adopted, read as follows:

“The objects of this society are to promote union and harmony among all respectable and well-informed dental surgeons ; to advance the science by free communication and interchange of sentiment, either written or verbal, between members of the society both in this and other countries ; in fine, to give character and respectability to the profession by establishing a line of distinction between the truly meritorious and skillful, and such as riot in the ill-gotten fruit of unblushing impudence and empericism.”

Upon this broad foundation other associations were soon formed and colleges were opened, and with the result of their labors its advocates were well pleased, and experienced a just feeling of pride in the giant strides of improvement by which dentistry had advanced to a recognized profession. Among other associations organized was the Kentucky State Dental Association, in April, 1860. You are all aware of the fact that her efforts have ever been in the right direction, and we are glad to have with us to-day some of her charter members, and we all can unite in a just feeling of pride in the fact that our specialty is recognized as a specialty in medicine, yet we must acknowledge the fact that all that has been accomplished in our profession in the past, has been done by an honest, intelligent and earnest effort, and after all that has been witnessed there remains a grand work for the future along this line.

As your presiding officer, I would suggest that this Association faithfully perform all that our Digest makes binding upon us, and in this way maintain the dignity of our profession, and encourage those who are watching our example. I think we should make a special effort to enlist every reputable dentist in this Commonwealth, who is not a member of this Association, in the work already begun. I can think of no better means than to authorize our Executive Committee to send out special invitations requesting such members to attend our next meeting, and when they are acquainted with our objects, I verily believe they will support them.

I will now call your special attention to some things already mentioned :

First, It is gratifying to us that the ranks of our Association has not been invaded by death during the past year. The profession at large has been encouraged by the action of the National Association of Dental Faculties in raising the standard of dental education ; also by the united support given Dr.Crouse in the noble posi-



tion he has taken in the interest of dentistry. We have seen how our profession started as a trade, and we see it as a specialty in medicine. In view of these facts, we should remember it is our incumbent duty to maintain her honor, and to do this we must perform an honorable part in this grand work. We must not allow selfish motives to sway us in what we have set out to achieve. We claim to be a specialty in medicine. What is the fate of a man in that fraternity who offers his services to the public upon the ground that he works for the least money, gives a certain medicine and an anæsthetic in surgical cases? He would be condemned by every honest man in the profession. From this time forward, let it be known by all men, that the dental as well as the medical profession will perform all duties pertaining to their profession upon scientific principles.

Now gentlemen, after thus occupying your valuable time, if anything has been said to strengthen you, or advance our profession, I shall feel that my effort has not been in vain.

With your hearty support, I trust this meeting may be of benefit to us all.

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#### BABBITT METAL VS. COMMON SENSE.

BY CALVIN S. CASE, D. D. S., M. D., Jackson, Mich.

In the *Ohio Journal* for September, there appears an article entitled "Simple Methods," which should be read in its entirety in order to fully appreciate that which I am about to say in regard to it.

Occasionally a dental writer seems to forget that modesty and professional courtesy counts for much, and that the dental profession is composed largely of skilled and experienced dentists who possess individual capabilities for recognizing truth and a willingness to adopt it whenever and wherever found.

Dr. L. P. Haskell has repeatedly told us for years why Babbitt-metal alone should be used for dies, and yet, how very sad and annoying it must be to one who so freely assumes the role of teacher and critic in his specialty, that this perverse and unreasonable profession should go on using zinc; and how awful that "still the students in most of the dental colleges are put through the ordeal of making zinc dies, no matter if they have been previously instructed in and realize fully the benefits of the simpler methods of Babbitt-metal."

With reference to the difficulty of manipulating zinc for dies, he says: "It does seem strange that so many dentists cling to methods of work that are cumbersome and difficult;" and again, "I do wish I could make dentists comprehend that the making of metal plates is simplified to a remarkable extent by the use of Babbitt metal dies."

Now let us truthfully examine the relative value of the two metals for dies and see if we can find more than a ghost which has caused this bewailing protest.

Zinc fuses at about  $270^{\circ}$  F. higher than Babbitt metal. It pours as easily and makes as clean and sharp a die. Being much harder than Babbitt metal it more perfectly retains its sharpness and general contour during the process of swaging—a matter of no small importance in some instances. A counter of lead (or lead and tin) if properly handled can be poured directly upon it with no fear of fusing its surface, where as with a Babbitt-metal die, lead cannot be used for a counter unless alloyed with tin to reduce its fusing point, and even then much greater care must be used to prevent fusing the two together—especially where thin and extended portions are surrounded and inclosed by the hot metal of the counter. The cost of an ordinary zinc die with lead counter is 50 cts. The cost of an ordinary Babbitt metal die with lead and tin counter is \$2.00.

To sum up, we have found that zinc requires a little more heat—in other words, a few minutes longer—to melt it. Not one other thing can be said as a pretext for all this hue and cry about its being "cumbersome and difficult to use" in the construction of dies as compared to Babbitt metal. As a matter of fact, if the whole subject of swaged metal plates hinged upon the comparative manipulative qualities of the two metals for dies, almost everything would be in favor of zinc—or zinc alloyed with a small proportion of tin.

But I hold that a difference in this particular—little or great—is of no importance if it be found that for the particular case in hand one or the other metal will produce the most satisfactory plate. And I wish to say right here I am not opposed to the employment of Babbitt metal for dies. It has its proper place as I shall endeavor to show. I simply wish to protest: First, against discarding the use of zinc under a false impression relative to the difficulties of its management, or other reasons mentioned later, and

Second, against the employment of any one metal, the peculiar qualities of which—from a scientific standpoint and according to the experience of many of the best men in the dental profession—is not calculated to fully meet every requirement, or to combat influences of appreciable variations in other particulars.

He tells us further:—“It (zinc) is not reliable; \* \* it does result in annoyance and worse than all *misfits*.” He further says he has “a large collection of models, comprehending almost every thing that was ever seen in size, shape and condition of alveolar border and palatine surface. Each plate when swaged fitted the model and the mouth; no adjusting with pliers and burnishers,” \* \* \* ‘In the use of Babbitt metal dies and the tin and lead counter he never finds it necessary to make even a second counter.’

From this and other things in the article, one has a right to believe, if he chooses, that those once prevalent,—though now rare—dentists “without a single failure” are not all dead.

In combating these last charges against zinc as compared to Babbitt metal for dies, it would seem to be useless to do more than repeat Dr. Haskell’s words in reference to the fact that zinc is used for dies in a majority of dental colleges. Is it at all probable that the men who are chosen to fill the chairs of prosthetic dentistry in the various colleges are incompetent and inexperienced, or perverse and dishonest, in continuing to teach the use of a metal for dies which is unreliable and produces misfitting plates, when by the use of another metal that would “simplify the whole operation”—or even make it ten times harder, if you please—a perfect fitting denture, as is claimed, *would invariably result?* And is it probable that a large majority of the entire dental profession would to-day approve the use of zinc—not alone, but in connection with Babbitt metal—for dies, without good reason, when a man eminent in the mechanical field of dentistry, has been striving for ten years or more to teach them better?

About ten years ago I listened to a studiously, and what seemed to be a scientifically prepared paper, by a professor of prosthetic dentistry in one of our most prominent dental colleges, which was written to combat the same Babbitt metal theory that had then appeared from the pen of Dr. Haskell. The object of the paper was to show that zinc, and not Babbitt metal should be used for dies. The author recognizing the expansive quality of plaster, had determined that the contractility of zinc was necessary to overcome this



change in the model, and would result in the production of a die more nearly the shape of the mouth than the model itself, or at least one which would produce a plate whose shape and bearings were more often calculated to retain it in position with ease and comfort than if struck over a non-contracting Babbitt metal die. And so far as I know, the author of that paper—a man who is at least the peer of Dr. Haskell, or any other man in this department of dentistry—continues to this day to use and teach the use of zinc alone for dies.

Now is it reasonable to suppose that one of these men is all right and the other all wrong? Is it not more likely, as in other instances where radical opinions by equally able men are diametrically opposed to each other, that somewhere in the middle ground the more truthful guide to correct practice may be found?

But let us examine the question for ourselves in detail:

It is a well-known fact that plaster of Paris always expands in the process of hardening and drying; that certain plasters expand more than others, and while in the majority of cases the influence of this change is not felt, instances do arise which are affected by it to an appreciable extent. In fact, it is believed by many that this is one of the principal causes for those unaccountable misfits in rubber dentures, where it is known that the impression was so perfect that it could hardly be removed from the mouth.

Just what action takes place to produce this expansion of plaster may be as unimportant as it is impossible for us to know. Yet it is interesting to note that water in changing to ice expands because the attractive and repellant poles of its molecules in the process of freezing produces a small vacuum in the center of each little star crystal. Some such process in the "water of crystallization" may account for the expansion of plaster.

In all bodies not locally bound, which expand or contract under the influence of a force which acts upon all its molecules alike, the particles move relatively to the center of the mass in proportion as they are distant.

For instance, the movement at the ends of a railroad rail during the change of seasons is quite apparent, but gradually diminishes as we approach the center. And this movement at the ends exactly measures the expansion or surface enlargement which would occur in a ball having a diameter equal to the length of the rail, if all its particles could be subjected to a like thermal change.

If mouths produced a model that was always regular in shape, having a surface that was equally distant from a single focus or center of mass, exact data could be determined and a choice of such metal for dies be made which would most nearly overcome the activities of the plaster impression and model.

But unfortunately under the circumstances to which we are bound, no such regularity of movement occurs. The material forming a model of an upper—especially if the arch is high, the posterior alveoli broad and the base low—will be disposed in irregular masses which, in the process of expanding or contracting, will act somewhat independently, yet locally bound and influenced in movement by their association. The surface particles also being unequally distant from their several foci, nothing like proportionate change can possibly result.

These facts seem not to have been fully recognized by those who think to overcome this irregular and disproportionate expansion of both plaster impression and model by an exact reciprocal contraction of a zinc die, though it undoubtedly would more nearly reproduce the shape of the mouth I have described—everything else being equal—than one made of Babbitt metal.

I am aware of other ineradicable conditions that at times are more difficult to overcome than the expansion of plaster or contraction of metal, which also tend to preclude the possibility of making a swaged plate that exactly counter duplicates the surface of the mouth upon which it rests.

This point I wish particularly to emphasize, for whatever be our desire or fulsome claim, the most skillful can but approximate perfection in this particular. Nor is it a condition to be wholly desired if we expect perfect retention.

We probably never produce a plaster model that presents an exact duplicate of the surface shape of the mouth; nor two models that are exact duplicates of each other. Nor can this be otherwise so long as mouths are composed of soft tissues that are thrown more or less from their normal position by the varying qualities and consistencies of impression material, and from day to day by environing influences; to say nothing of changes which take place in the plaster after it has set.

Again—if I may be allowed to observe at the risk of being invited to take instruction\*—the sand impression of the model, un-

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\*[See closing paragraph.—Ed.]

der the most skillful management, will at times be undiscernibly—if not unavoidably—enlarged in places.

To those who will carefully and conscientiously consider these things there can be but one conclusion, *i. e.*, duplicate exactness is rarely if ever attained, whether the die be made of Babbitt metal or zinc.

Every plate is stamped by the ability of the dentist to meet special requirements, in certain changes which he makes upon impression and model ; such changes being necessary and often sufficient to overcome other unavoidable changes which would otherwise detract from a perfect fitting denture. But as it is not always possible to calculate to a nicety the influence of changes which necessarily arise or are produced, I often find upon trial that it is an advantage to have both contracting and noncontracting dies. Without attempting to formulate causes or the influence which the shape of the mouth exerts upon plaster and metal, I am fully aware from many trials where two dies—one of Babbitt metal and the other of zinc—are made at the same time from the same model and with the same care, that in about one-half the cases a plate swaged upon the one will not retain its position as perfectly as when swaged upon the other ; and vice versa—the difference being frequently quite marked.

As it is impossible at the outset to determine which kind of a die will produce the most perfect result with the particular case in hand, I invariably make for every case one of Babbitt metal and another of zinc. The little more work required is always compensated by a choice of the advantages which either affords. I cast both counters over the zinc die. The zinc die being much the harder, the plate is first swaged upon it, and tried in the mouth. If not satisfactory, the Babbitt metal die is used—after which I not unfrequently return to the zinc.

In insisting upon this system being carried out at the Dental College where I have the honor to teach, I believe I am doing that which is for the best interests of its students ; even though some of them may have been instructed in the simpler method of Babbitt metal alone.

As a part of the article in question there occurs a criticism which seems so unjust and discourteous that I cannot leave it unmentioned. In fact, it was that which induced me to take up



my pen on this occasion, in defense—as I believe—of truth and fair dealing.

After ending his article proper with :

"I have instructed hundreds in these methods and have yet to hear of the first one who has returned to his ' wallowing in the mire ' of zinc dies."

He continues with the following :

"Since writing the above I have noticed in the *Journal* for June, an article on 'Swaging Plates,' taken from the *Texas Journal*, and it is so apt an illustration of the subject, I desire to call attention to it. Were it a necessity to follow such a plan I should want to quit making metal plates.

"The first thing the writer does is to take 'three or four impressions' ! Well, my patients think *one* impression is all they wish to endure, and it certainly is enough if that is a correct one.

"Then he furnishes a formula for a composition for impressions that will enable him to cast his dies in them, instead of moulding sand, 'on account of the difficulties of sand moulding.' I wish I could have this writer in my laboratory for ten minutes only, and show him how the 'difficulties of sand moulding' would vanish. Then comes the *zinc* die again, and follows up with a zinc *counter* for the *final* swaging. Did he ever think for a moment of the result of using both die and counter of the same metal, and especially of zinc ?" etc.

Here is that part of the article from the *Texas Dental Journal* which has caused the above exhibition :

#### SWAGING METAL PLATES.

"That a well constructed metal plate will subserve a better purpose than any of the plastic bases now in use for that purpose no one will doubt, but the question arises, how are we to overcome the various difficulties attending the construction of metal plates ? the chief of which is a perfect adaptation. Those who have had any experience in this class of work know something of the difficulties in sand moulding.

"Formula for impression :

"Material, Chalk, iii oz.

Marble dust. i oz.

Finely Ground Asbestos, i oz

Oil Pep., gtt xxx.

Add Plaster, viii oz.

Sig. Use just as plaster.

"After taking three or four impressions so as to allow for any accident, place them in the sun or over a slow fire, and after thoroughly dry, build up a rim of moulding sand around each, into which carefully pour the zinc, just as the bulk is all melted, or just as it begins to congeal around the edge, adding drop after drop to each one, as they sink down in the center until each is full.

"The counter dies are made in the ordinary way except one zinc counter for the final swaging, which is made by pouring the moulten zinc at the lowest possible degree into a die, previously chilled in cold water and wiped perfectly dry."

I fail to see the propriety of so autocratically criticising a fellow worker who, with becoming modesty, puts forth in detail a new,

and, so far as we know, a valuable method for constructing metal dies.

If it does all that the author claims—(and what right have we who have not tried it to think otherwise) it will certainly banish much of the work—which is always unpleasant and sometimes difficult—and many of the influences I have mentioned which tend to change the shape of a die and plate. It can also be used as well for making a Babbitt metal as a zinc die. Nor is the method suggested to avoid the difficulties of sand moulding alone, as Dr. Haskell would lead us to infer, but chiefly—the author claims—to obtain a more perfect adaptation of the plate. One can but infer that the gentleman from Texas knows something about sand moulding, and doubtless will find it unnecessary to accept the professor's modest offer to show him in *ten minutes* how to manage every kind of model in sand moulding so that when the plate is swaged it will fit the die, the model, and the mouth, without the need of a second counter or the slightest change in any particular.

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#### ADVICE TO YOUNG PRACTITIONERS.\*

By J. T. ABBOTT, D. D. S., MANCHESTER, IOWA.

The principal object in view that suggested this paper is intended as caution to the younger members of our profession. Whatever is worth doing, is worth doing well. And a habit once firmly fixed, whether for good or evil, is not easily changed. The student of dentistry has at the present time not so much to contend with as had the old veterans. Their knowledge was gained in the school of experience, but how kindly and almost with veneration we speak of those bright lights, who by digging and delving have made it easier for you to continue in their beaten tracks. Many so-called students of dentistry are too apt to be satisfied with the knowledge they have gained at the school, and hence form a habit of carelessness. I apprehend there are vast fields yet unexplored, and the future dentist will smile at the ignorance of the present.

But to come down to detail and render these thoughts tangible, we should never commence an operation with a feeling that the price is not sufficient for the time and skill. If we feel that we are

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\*Read before the Iowa State Dental Society, 1890.

giving more than we get, one is liable to form the habit of doing what he does, carelessly, and will try to justify himself with the plea that the work is as good as the pay.

Every operation should be better, if *possible*, than the preceding one. Let us remember that the best we can do, with all the light and knowledge we have, is very poor compared with Nature's handiwork.

To the student in dentistry (I should say to the one just beginning, for we are all, or should be all of us students, whatever our age or the length of time we have been engaged in the profession) it is often provoking to be told that Mr. A or Dr. B will do the job for a price much less than you will, and perhaps you will be told that he is an old, experienced hand and why can't you work as cheaply as he can. You will find that the tendency of prices, or rather the inducement to lower your price in order to secure the patronage you covet, will come upon you with strong force, especially if you know that you will lose the patronage of such people, unless you cater to their sordid ideas, or we may say to their ignorance. One of the best replies in such cases is to say that each individual is the best judge of his own merits, and the remuneration he should receive for his services.

It required many long years for some of us old practitioners to learn the above rule and adopt it fully. Gladly would we recall many operations that we could have improved upon. But no, they stand as living testimony against us, and you should feel it not only your privilege but your duty to profit by our experience, and never compromise your professional standing by stooping to the low tricks of the incompetent and unworthy. Fix your prices commensurate with your ability, and never, for the purpose of securing patronage, deviate from it, except in cases of charity. Do this, continue your improvements, adopting the standard tested methods, use none but the best material. On the other hand if you wish to make a failure, and your life work not a success, so that it may be truthfully said of you, "The world has not been made the better for your having lived in it," then take the opposite course, travel from house to house, advertise heavily, and lay great stress upon your ability to do *jobs* better and cheaper than any one else, fill teeth for 50 cents with amalgam, gold \$1.00, extracting 25 cents, other work in proportion, and be sure and warrant all jobs, and you are on the road to a depressed mediocrity, a discredit to yourself,



and a disgrace to the profession, and last, though not least, a lasting curse to your too confiding but duped patients.

Always speak well of a competitor, especially a competent one, and if we have really incompetent competition, we can best subserve our own interest by at least letting them alone. You may rest assured your patients will in due time learn the difference. Another habit worth forming and tenaciously adhering to, is cleanliness. Cleanliness in person and office. See that the hands and instruments are scrupulously clean, and constantly kept so, and the spittoon should be cleaned after each case of extraction, so that when the next patient takes a seat in the chair, they may find everything clean, and in order. A sensitive patient will be likely to be disgusted, and often made nervous by unkempt surroundings. A dentist should never allow himself to become what is termed slovenly. It is not necessary that he should wear the finest of clothing, and appear dudish, but his clothing should be in a tidy and neat condition.

Every dentist can and should be an educator of his patients, by a judicious direction of conversation. Topics may be unobtrusively introduced, and practical points given, that perhaps, in many cases will be as beneficial to the patient as the operation performed, avoiding pedantic style and technical phrases.

If you fill teeth and give no direction to the patient for their cleanliness, you have only half performed your duty. You must not expect that every patient will follow your well-timed advice and instruction, but that should not deter you from giving such instruction. It should be continuous, "line upon line, and precept upon precept." What if some of the seed sown does fall upon stony ground, enough, if sown at the right time, will take root and produce right results. We may fail in sufficiently impressing the patient with his own responsibility to himself, not from lack of matter, but of manner. We may so state the case as to strike the ear, but not the understanding. The impression sometimes received by the patient is that the operator is simply airing his knowledge of Anatomy, Physiology and Materia Medica, trying to convince the patient that he is made of much finer clay, and cast in superior molds to the common run of mankind. When we become so verbose and pedantic we expose our ignorance, we talk not to the patient, but with jangling sounds, out of harmony, we bore and disgust him. Our direction and advice should be given in language

easily understood, with assurance on our part that we expect the co-operation of the patient, and without their assistance that our efforts will largely prove useless. Make them equally responsible with ourselves. Every operator is aware of the fact that some of his best operations fail for want of care on the part of the patient. Patients have not been made to see their responsibility. Their idea is that the dentist has filled their teeth, and if there be a failure the dentist is alone responsible, and when the dentist fails to give proper instruction to the patient, he is responsible.

As well might the farmer, who leaves his machinery exposed to the spring, fall, and winter storms, blame the manufacturer for the rot and rust it sustains, as the person whose mouth is not kept free from extraneous substances, and allowed to accumulate in disgusting quantities, blame the operator. The dentist will, however, receive the blame so long as he fails to do his whole duty in this respect, and when you have performed your duty to the patient, and from carelessness, or, for lack or want of time, he failed to co-operate with you, and failures result and are charged to you, you will do credit to yourself and honor to the profession by refusing to give said patient the benefit of your knowledge. Such a course will usually produce the desired result, and you will ever after have a careful, pains-taking patient, but if he leave you, comfort yourself by repeating that good, old hymn, "We rejoice to see the curse removed," or words to that effect.

Never attempt to regulate irregular teeth, unless you can have the co-operation of the patient. A failure to regulate will do you no good, but whatever the cause of such failure, it will have a bad influence, not only upon the patient, but also, often the influence will be extended to many others, who cannot know, and will not understand that you are not responsible. They know there has been a failure, and of course the operator is at fault. Therefore, make yourself sure of the entire confidence and co-operation of the patient, and parents, or guardians. Refuse to attempt an operation, unless you can be quite certain of the final results. It requires all the firmness and perseverance of most patients to submit to a protracted case of regulating, but when accomplished it is like "bread cast upon the waters."

PREPARATION AND FILLING OF PROXIMAL CAVITIES AND PROTECTION  
OF LATERAL AND CERVICAL MARGINS.\*

BY I. A. FREEMAN, D. D. S. CHICAGO, ILL.

The subject before us at this meeting is one that should interest every practitioner of dentistry, for I believe no one engaged in this specialty can rise and say—I am infallible! My operations upon Proximal Cavities always meet the requirements (*i. e.*) that of permanently arresting caries. Upon this surface, there are many members of the profession who are able to perform these operations, whose efforts are crowned with comparative success; but every dentist sees failures and failures and of his own work too. In fact it is a matter of great disappointment and chagrin to us when we see our patients returning with recurrence of caries; and not only do we see our own patients but those of eminent men here and abroad whose operations have simply retarded the disease in its work of destroying the tooth. Operations of inferior quality may serve fairly well upon other surfaces but here we see failure of the most carefully performed and painstaking operations.

Not long since a gentleman presented himself for treatment. Upon examination four large beautiful gold fillings were found, monuments of the skill of the operator and endurance of the patient. These plugs were all of them badly undermined, the decay reaching pretty well from the cervical line up the lateral walls. These were the work of one the most conscientious and thorough practitioners of this city. And they were failures, and this within two and one-half years from the performing of the operations. Now I do not speak of this case in a spirit of criticism, as I frankly admit like results from my own hand. But only as a case in point.

“Some one has said that it requires more good judgment and more brains to properly prepare a cavity than it does to fill it.” Here may lie the trouble with many of us.

That there are almost insurmountable difficulties in the preparation and permanently filling of these cavities, especially upon the proximal surfaces of bicuspid and molars are certain. Hidden from direct view nearly always, so that we can but rarely see the completed work. The changing of the position of the tooth in

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\*Read Before the Chicago Dental Society, November, 1890.



the dental arch, which is brought about by unseen influences, (hypertrophy of the alveolar tissue not being the least of them.)

Proper or improper use of the dental organs. Fluids held in position by capillary forces, which in many instances remain so long undisplaced that chemical change takes place and acidity resulting which, while but slightly so, is persistent, decalcifying to the enamel and so weakening the structure around the filling, which may have been perfect in all its points when the operation was first made. These are some of the difficulties to be met with in our efforts to arrest the disease in these localities.

This subject has been discussed in dental societies and has been written upon by the great lights in the profession during the past decades. These have advanced their peculiar views, some embracing new theories, all making use of principles by which each hopes to reach the end desired, and which may serve as a guide to all in accomplishing this object, and so be helpful to the profession generally.

Some believe in wide, permanent spaces, free cuttings, and partial restoration of lost tissue is their motto. Others say cut freely and restore the contour fully, they having in mind the comfort or discomfort of the patient while masticating food. They say irritation at the gingival plexus is a great source of trouble not only immediately by setting up pain, but that by irritation a peculiar condition of the mucous glands is developed whose secretions in this condition are of acid reaction causing decomposition of the tooth structure in which it is bathed, thus undermining the stopping which although carefully inserted has, owing to these conditions, become a failure, hence they advise the restoring of the lost portion of the tooth and giving a bell shape to the crown, and thus, when the teeth have resumed their normal position, in the dental arch they will touch the proximate tooth and protect the gums from this irritation.

There is some sound reasoning in all these theories. Now what shall we say or do with this problem?

I do not come before you with any new or patent theory of treatment for these cases, and shall only attempt in the few moments given to this subject, to set before you what seems to me to be the proper plan of procedure with regard to the treatment of these conditions, and so I trust aid in bringing out a free discussion of this most intensely interesting subject.

Let us take for our consideration a typical cavity situated upon the anterior or meso-proximal surface of a superior bicuspid tooth, it matters little whether it be anterior or posterior only for convenience at this time, the first thing to be done is to gain space in which to operate. This may be accomplished by any of the methods in use, only do not attempt to fill while the tooth is sore, from force exerted to gain the space.

In this instance decalcification has passed to an extent involving considerable of the surface from the point of contact to the cervix, deep-seated caries has resulted, but not to an extent involving the pulp, this is a medium case as far as form and structure are concerned. A slightly bell-shaped crown, a triangular space between the teeth, looking from the point of contact having its base toward the gum, is seen, so that this surface ought to be freely cleaned of deposits of food and other substances, and the tooth preserved from decay upon this surface.

Now why is it that we find this cavity, or, what has caused it? is the first question we should ask. If we examine the surface where the proximate tooth touches this one, we will find the surface is clean, smooth and burnished from the friction given in the movement of the teeth in the process of mastication; just above this point is where the line of decay is met; near this point the space is very narrow. Evidently capillary forces have held the oral secretions in this space and not being displaced, decomposition takes place and acidity is the result, the enamel is broken down by this chemical action, giving up slowly but certainly, but when the process has reached the dentine, it more easily succumbs, because of its lesser density the tubuli offering easy access to the agents of death.

In our attempt to arrest the further progress of caries and to do so permanently, a different form should be given to the tooth upon this surface; first, of course, all diseased tissue should be removed, and that means especially the softened or changed enamel; each border or wall should be carefully examined with a strong magnifying glass. A strong light is necessary, and for this purpose it may be reflected upon the surface with a concave mirror. After we have perfectly circumscribed the cavity, we should so form the lateral walls as to get the conditions most favorable upon which may be consolidated the material the filling is to be made of, and that will be a beveled edge or border; this should be from within out-

ward all around the cavity, the cervical as well as the lateral walls. The coronal surface should be cut out to a union with the meso-coronal fissure the form of the cavity within should be made, and the cervical wall cut to nearly a level with the beginning of the angle of the beveled edge. This wall should present a curved line or circle, i. e., without angles. A groove cut within the dentine should extend from the cusps toward the cervix, extending fully to and a little past the buccal and lingual portion thereof. After the cavity has been prepared, the sharp angles well rounded, smoothed, etc., the case is ready for the insertion of the filling. In the preparation of cavities we should so change the contour of the tooth that at no point will it come in contact with the approximate tooth, and there should be enough tissue removed so that when the filling has been finished there will be enough material overlapping the walls to protect them from recurrence of decay, and we will have left sufficient space to break up capillary attraction and consequent retention of saliva or food, so that fermentation does not take place as before, the movement of cheek and tongue having free action and so displacing those substances from this surface.

Now that we have the cavity prepared and have decided to fill it with gold, it will perhaps be admissible to spend a few moments upon this part of the operation, and let me say that we should have a system or manner of procedure, and that a good one. I find by observation at clinics and in conversation with my fellow practitioners, that many do not proceed by any plan in filling with gold, but begin the filling in a sort of hap-hazard way. Therefore, I say we should have a system of procedure; for instance, we should line the cavity with non-cohesive gold, and this may be done by taking the first piece or pellet and carrying it against the cervico-lingual border and holding it in position until a pellet of cohesive gold is brought down upon it; these are held in position and condensed; when another pellet of cohesive gold may be condensed upon its fellow pellet No. 2, then a pellet of non-cohesive gold should be carried against the cervical wall lower down and covered by one of cohesive material; all are held in position and perfectly condensed; others are added in same manner along the walls indicated, until they reach across to the bucco-cervical border, when a pellet of the non-cohesive material can be brought in to act as a wedge, which when covered by one of cohesive gold will hold the mass securely in position; the mass can then be solidified, more material



added until the filling is completed, using the cohesive ribbon gold to bring up and finish the surface. Rolled gold No. 30 gives a very solid surface and without doubt should be used upon masticating or coronal surfaces.

The reason for beginning the filling at the cervico-lingual border, is that you can more readily see that the border is more perfectly covered at that time than at any time later in the construction of the filling, for you have a better light and better opportunity to view the cervico-buccal border at all stages of the work than can be usually had upon the cervico-lingual border.

I do not recommend the use of matrices in performing these operations and my reason is that they obstruct light, and as a general thing they are in the way, so obstructing the free manipulation of the instruments that we are unable to carry the material to cover the cervical border as perfectly as we could without them.

The manner adopted by some is to consolidate the material upon the cervical wall and finish before proceeding further, certainly unless we gain space enough to see the border we will be unable to know of a certainty that there is not too much material extending over the gingivus unless we finish at this time.

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## PROCEEDINGS OF SOCIETIES.

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### CHICAGO DENTAL SOCIETY.

Regular meeting, November 4, 1890, Dr. C. N. Johnson, President, in the Chair.

DR. I. A. FREEMAN read a paper entitled, "Preparation and Filling of Proximal Cavities and Protection of Lateral and Cervical Margins."

DR. B. S. PALMER, in opening the discussion, said: It is a trying thing for me to get up before a dental society and tell the older members what I know about dentistry. I always expect them to say, "Well, I tried that method and discarded it, before he was born."

Every one who practices dentistry has methods and opinions of his own as to how to do a certain piece of work, and it is so with me.

The paper I like very much, although I do not agree with the essayist in all he has to say regarding the filling of proximal cavities. The filling of proximal cavities, to make them stand, and do their work as we would wish them to is one of the most difficult operations we have to do. In my own practice I am using the matrix, and I would like to have a tooth when filled, restored, as nearly as possible to its normal shape and form. I don't know that I can add anything to what the essayist has said concerning the preparation of cavities, except that I think I learned a good point from Dr. Salomon who says he seldom if ever uses the right angle bur in the preparation of proximal cavities, where he wishes to fill with gold. If prepared with the straight bur the opening into the cavity must of necessity be large enough to admit of free access to all parts of the cavity for the introduction of the gold filling. For that reason I would enlarge the opening into the cavity as much as possible, even sacrificing a considerable portion of the tooth sometimes to get thorough access.

In regard to matrices, there are a great many different kinds, and every one has his favorites. There is no one matrix suitable for all cases. The ideal matrix will fit the cervical wall of the tooth absolutely and perfectly, and must be held firmly in that position while introducing the first of the filling. I have here for your inspection a matrix holder or clamp, designed by Dr. H. P. Booth, to be used in connection with flexible matrices of tin, brass or copper, holding them firmly at the cervical margin. For a great many cases I find it very useful.

My method of filling proximal cavities is something like this: Where I can do so, I would start the filling, covering the floor or bottom of the cavity, also cervical and lateral walls, using soft and cohesive gold. After introducing enough of the filling material to give firmness and stability, I would remove the matrix if I were using one, and finish and burnish this portion of the filling thoroughly and perfectly. This will give me a flattened surface along the cervical margin, with plenty of space between this and the adjoining tooth. Then I would again introduce the matrix, fasten firmly against the finished wall of gold and continue the filling, contouring from this point to near the masticating surface. When the filling is finished I have a natural tooth in form, no point of which touches the adjoining tooth excepting a surface of gold, whose lateral margins are entirely exposed and self-cleansing, and

whose cervical wall in consequence of the flattened condition of that portion of the filling immediately above, is readily cleansed by means of floss silk and a tooth pick.

In regard to the case mentioned by Dr. Freeman, where gold fillings had given out in two and a half years, I do not know what others would do, but I would replace them, covering the cervical margins with copper amalgam, then filling with gold, contouring by means of the matrix as previously described. I think such fillings will stand where gold alone will not.

In proximal cavities between bicuspid and molars, where I can get good access to the buccal margins, I often in building up with the matrix, pay no particular attention to getting good adaptation along this wall, then when the tooth is filled and the matrix removed, with a fissure bur cut out the gold along this margin and fill again from the buccal surface.

When I have proximal fillings completed, with their cervical margins protected by means of copper amalgam and the natural form of the tooth restored, I at least have the satisfactory feeling that I have done the very best I could for the permanence of the operation and the comfort of the patient.

DR. GARRETT NEWKIRK: I was much pleased with the paper; also with the remarks of Dr. Palmer in opening the discussion. Dr. Black read a paper at a meeting of the Odontographic Society last winter, upon the interproximate spaces, which was published in the DENTAL REVIEW for July. He held that the value of contouring was not, as had been supposed, so much in the simple contouring itself, but in that it preserved the interproximate space in accord with nature's plan of preserving a healthy gum, which thereby had room to pass well up between the teeth and so cover and protect them at their necks.

I have seen a great many failures within the past year which, it seemed to me, could be accounted for by the teeth not having been contoured, but left with parallel surfaces, so there was no space for the gum tissue to perform its office and no space for cleansing. Hence I would lay stress on this point—the preservation of the interproximate space by restoring the natural forms of the teeth.

If I understood Dr. Freeman, I think he said he would not have teeth touch—not come in contact at any point. I think there *should* be a point of contact. It seems to me that the teeth must touch in order to maintain them in their proper positions.



Another cause of failure—and I see evidences of it so often—I have seen it at our clinics. That is the insufficient cutting away of doubtful tooth substance extending along the cervico-lingual or labial border in the preparation of cavities. There is a disposition to save too much or a failure to see all that should be removed. Again, I must confess, I think we sometimes try to save a pulp when it should be sacrificed, a nearly or quite exposed pulp, where the tooth is so thin antero-posteriorly that it is difficult to obtain the room necessary for anchorage anywhere near the cervical margin without filling close to the pulp or leaving too much decay under the filling. We do not excavate sufficiently, because we are anxious to save the pulp, and very often the pulp from thermal changes or otherwise is eventually lost. If we have a nearly exposed pulp and are satisfied we can have a better permanent operation and the patient is well along in years, it is better, in my judgment, to sacrifice the pulp and prepare the cavity so thoroughly that we have good foundation and anchorage. Another cause of failure is in the attempt to use gold exclusively.

Numerous articles have been written on the use of gold and amalgam in combination, and nearly all advise the operation to be done at one sitting; insert the amalgam with matrix, then put gold on it. I do not know how others operate, but I cannot use a gold plugger on soft amalgam without having it tarnished. That does not seem to me to be a nice way of inserting a filling. If I am going to put amalgam at the base of my filling, I want to use some sort of matrix, Dr. Brophy's or some other; insert the amalgam as a base, firmly condense and leave it until it is thoroughly hardened, then fill the remaining cavity as I would one that had no amalgam in it. In many deep cavities in bicuspid and molars, I have been using lately copper amalgam, filling just the deeper portions, then when I come to fill with gold bevel the surface of the amalgam, cover it over down to the gum, getting anchorage forward and to either side. I do not see any objection to such an operation, except one, that occasionally, in the course of time, as Dr. Ames says, the amalgam color "crawls up" on the gold so as to discolor it. I would not put in an amalgam and gold filling at one sitting. I want that distinctly understood.

I desire now to make a few remarks regarding the matrix. In putting in a gold filling with a matrix I have found the same objection mentioned by Dr. Palmer. I am not able to see perfectly

what I am doing. I prefer to have some point of anchorage, even if it is only slight, so that I have some place that is *fixed* from which I can start, using fine instruments at first, and then I can use soft gold, carrying it well over, and feel that it will stay where I put it. When I have anchorage on both sides, and gold firmly wedged into the middle, I am satisfied that it will stay.

Another matter, and I am through. The burnisher, the strips and discs. I believe we depend too much on the strips, especially the coarser ones which leave a roughened surface difficult to make smooth, and we use the burnisher too little in condensing gold firmly in all directions over the margins. I believe it would be far better if we used the burnisher and fine knives or scalers to chip away the surplus, and if we left the strips off entirely in many cases.

DR. C. F. HARTT: It is a very mean man that will sit here and hear his friends reflected unpleasantly upon or abused. The gentlemen that read the paper, as well as the ones who discussed it, have not said anything very friendly about the matrix. They say they have used it sometimes. I do not think the filling of proximal cavities in bicuspid and molars is as hard as it used to be. I do not believe our President, Dr. Johnson, thinks so. I saw him fill a cavity of that kind, with the aid of Dr. Brophy's matrix, at a clinic of the society some time ago. I don't care whether I have an undercut or not at the cervical margin. I want the cavity properly shaped; I depend largely upon that and upon the anchorage along the sides and in the crown. All the matrices in use at the present time are modifications of Dr. Brophy's.

DR. EDWARD A. ROYCE: I want to say something about using gold and amalgam at one sitting. I find great satisfaction in using it at one sitting. I would use a matrix for gold and amalgam every time. I start in with a layer of amalgam, then use good old crystal gold until it will pack solid. I then finish the filling with any gold I wish. I use crystal gold as it will take up the surplus mercury and form a union with the amalgam. The cervical margin is made of amalgam, and the union between the amalgam and gold is almost as perfect as it would be if the filling were made of cohesive gold, and the finish is as nice as any gold filling I could put in there.

In my practice I have a great many children, and in their younger days I find their teeth very soft. I found it very difficult to preserve them, for, if I used amalgam, or tin and gold, after a little

time the margins on the grinding surface began to give way and I did not get a satisfactory grinding surface; I did not get a satisfactory appearance of the mouth when open.

Copper amalgam to me is dirty looking stuff to fill teeth with. With amalgam and gold—I get the cervical margin made of amalgam—the adaptation is better. I get no fractures at the cervical margin, and I also have gold for finishing which is more presentable, and I find in my practice that gold and amalgam combined, finished at one sitting, is one of the most satisfactory fillings I insert.

DR. WACHTER: I would like to ask Dr. Royce whether he always uses crystal gold, or whether he has used any other kind instead?

DR. ROYCE: I have never found any other kind that will take the place in an amalgam and gold filling as satisfactorily as Watts' crystal gold. I keep enough of it in stock for that kind of filling.

DR. ALLPORT:—I have listened with a great deal of interest to the paper read by Dr. Freeman, as well as to the discussion upon it, and I feel that I have learned a great deal from both.

When I look back over my practice of forty-six years, and see how different it was then from what it is now, as well as how other good practitioners operated then, from what good operators do now, and think of the comparative success we had, I feel almost astonished at the results in saving teeth then obtained.

At that time it was a pretty bold thing to file between the teeth as freely as I did, for but few did it, but with the then status of dentistry, I am sure that it was the best thing that could have been done, and I obtained comparatively good results, for I always tried to so shape the teeth that the approximate surfaces would not fall together.

But do the best I could, in many cases the space would close up and the teeth falling together, would leave a convenient lodging place for the accumulation of food and the secretions of the mouth upon their broad filed surfaces which frequently led to decay around the fillings.

Those who did not separate as freely as I did refrained from it because they did not feel justified in sacrificing so much of the tooth structure, and I feel that the conservative idea is a good one. In the state of the practice then existing, those who filed the freest saved the greatest number of teeth, but as I look back over



my practice and see how many teeth were lost, I feel that many of them might have been saved had they been treated in a modern way. And yet, gentlemen, I feel that there are things connected with the present method of cutting away teeth that ought to be criticised. In order to contour, much valuable tooth structure is being uselessly destroyed which can by no possibility be replaced by anything so good. Much of this is unwarrantably done by dentists in order to make the operation easy for themselves.

The first idea of a surgeon should be to conserve as much of a leg or arm as possible, and the dentist should conserve as much of the tooth structure as he possibly can, consistent with making a good operation. He should conserve when it is not necessary to destroy. For this reason I feel like finding fault with—criticising—those who advocate the extreme cutting away of tooth structure, in order to contour. I hope no one will misunderstand my meaning in what I say. I do not desire to be understood as not believing in the practice of cutting away a tooth when it is softened or too frail to withstand the pressure essential to making a good operation, for I am certainly in favor of it, but, as I have said before I feel there is too much destruction of tooth structure by dentists in order to make their operations easy for themselves. They want an open field so that they can see what they are doing and use as straight instruments as possible in their operations. Surgeons do not always see what they are doing; they have to be guided a great deal by the sense of feeling, and sometimes cannot do otherwise. The dentist should do the same thing, and his touch should be so educated that with properly shaped instruments, if I may be allowed to make use of the expression, that he can shoot around corners. Though he cannot see the bottom of this cavity without the aid of a glass, he can accurately place the filling material where he wants it, thereby saving much of the tooth structure that is now too often sacrificed.

In the few minutes allotted to me I do not know that I care to criticise the paper, for I think the time can be better spent in telling you my method of operating in the class of cases under consideration, and then I want to hear others tell how they operate, so that we may each be enabled to improve our practice and better serve our patients, by making use of the valuable hints thrown out by each speaker.

But I want to say that, in my judgment, too much importance is attached to the idea of making our fillings as solid as possible, or as some express it, like molten gold ; for such solidity all through the filling is not essential to the saving of the tooth ; nor is it desirable to have fillings so very solid as this except at points where it is to sustain the friction and force of mastication. All the solidity that is necessary in order to prevent decay is to have it dense enough to exclude moisture, and if our fillings fit perfectly to the margins of the cavity, great solidity at these points is not necessary. The essential point is that the filling material shall fit perfectly to the surrounding tooth structure, and the less dense the filling is, so long as it performs this office the better it is for the tooth for the less dense the filling is the less the liability to irritation the tooth will be from the thermal changes, and consequently, the less liable the pulp will be to become irritated, inflamed and die.

We have all seen and taken out fillings that we could readily penetrate and pass our excavators through that have been in for a great many years, and yet when the cavity had been perfectly cleaned this filling saved the tooth effectually. This proves that great density is not essential to preventing decay around fillings.

As I have said before, it is the perfect fit rather than the great density of fillings, that is essential to preventing decay. Of course where friction and mastication occur, fillings should be as dense as possible, but I have seen many teeth ruined by too dense filling.

A great deal has been said to-night regarding drilling retaining-pits, but retaining-pits are not as essential as many seem to suppose, if we only use the right kind of material for filling and manage properly. If any present have had the pleasure of removing any of my fillings, they may have noticed that I seldom make use of retaining-pits and especially at the cervical portion of the cavity.

We old men, who commenced practicing over forty years ago did not make use of cohesive gold, nor did we know anything of what is now known as retaining-pits. Our gold was all then non-cohesive gold and retaining-pits came into vogue after the introduction of cohesive gold, and it is very difficult to put in good cohesive gold fillings without these pits, but with non-cohesive gold they are seldom essential. If I make them at all I usually make them under one of the cusps where there is no danger of wounding the pulp, and I pack my gold from that point down to the cervical

margin. Nevertheless I make use of a retaining point which is outside of the tooth.

What I say upon this point will be a difficult thing to report, but I am going to try to make it plain to those who hear me and see how I illustrate it. Let us suppose we have a cavity all ready to fill and that my two fingers, which I hold up separated are the teeth, with an approximate cavity in one of them. Now here is my pocket handkerchief, which I have rolled up in an oblong shape, which represents an oblong pellet of non-cohesive gold, sufficiently large to require a considerable pressure to force it into the cervico-lingual corner of the cavity. Now I place this handkerchief between my fingers in such a way that a portion of it passes over the lingual margin and onto the lingual surface of the tooth at the cervico-lingual point in the cavity, and at the same time presses against the opposing tooth. At this point I place my finger directly over the projecting portion of gold and press it securely against the lingual surface of the tooth I am filling, while the pellet is being condensed, the pellet being sufficiently large to rest against the opposing tooth, and my finger or thumb as the case may be, securely holding the gold, which projects over the cavity in place while that within the cavity is being condensed. From this point I proceed to pack my gold the same as I would had I made a retaining point inside of the cavity, and when the balance of the filling is packed there is always a sufficient surplus of gold at the retaining point to condense and finish perfectly to the margin of the cavity at that point.

As I proceed with the operation, if there is any little trouble of the pieces of the non-cohesive gold loosening under the plugger I mallet down small loosely torn pieces of cohesive gold on to the non-cohesive gold, and then proceed with the non-cohesive gold as before; but I am always careful to place the non-cohesive gold against the walls of the cavity, and when the non-cohesive gold is flush with the margins, use cohesive gold to cover the surface of the margins. But I commence to pack the strips or pledgets of cohesive gold from the inside of the cavity and let it lap over the margin. In this way there is never any trouble about the pieces of cohesive gold flaking off from the non-cohesive gold, it being secured from the inside of the cavity and packed toward and over the margin. It is next to an impossibility for it to be lost unless the entire filling comes out. I proceed in this way around the



entire margin of the cavity, and as I approach the grinding surface I use nothing but cohesive gold. But non-cohesive gold is my reliance against the walls of the cavity and it can be contoured the same as if I had used cohesive gold for the entire filling, with a greater certainty of the margins being perfect.

In regard to contouring I will say that I feel differently about it from what I used to and while I contour most of my approximate fillings to a certain extent, I am by no means what might be termed an extreme contourist, for extreme contouring leaves too great a leverage on the filling in masticating to justify it in most cases, and my observation teaches me that many teeth are broken by the force of mastication on extreme contoured fillings. For this reason I do not contour to the extent that some others do; such fillings look well and are artistic, but I do not think it to be a safe practice. At the same time a moderate degree of contouring is always desirable.

While it is pleasant to speak well of the dead, justice to the living requires us to speak the truth.

Dr. Webb, the apostle of contouring, was an extreme contourist and he was certainly a most beautiful operator but I never regarded him as a safe operator, and the more I see of his work, and the more I hear of it from those who have had better opportunities than I have to observe it, the more I feel that he lacked judgment in his operations. Had he been a less extreme contourist, and had he been less wedded to the use of cohesive foil, and appreciated more fully the useful qualities of non-cohesive foil, and used more of it in his practice, he would have left many more enduring monuments of his skill than he has. I say this in all kindness, but I simply state what I believe to be the truth.

In regard to using amalgam in connection with gold fillings I will say that I used to be strongly opposed to the use of amalgam in any form. Up to within about twenty years ago, I do not think I had ever used amalgam as a filling material in any shape. If there is anything that gives me satisfaction it is to acknowledge my faults, and I wish to say that under certain circumstances I now believe a good quality of amalgam to be one of the very best filling materials we have. I, however, never use it, as has been suggested here this evening, at the cervical margin as a base for gold fillings; nor has it ever occurred to me that it could be used in that way, nor did I suppose that a gold filling could be packed

over a freshly put in amalgam filling at this point. But, by the use of crystal gold, as has been suggested here by Dr. Royce, I believe in many cases it can be used to advantage, and I want to thank Dr. Royce for his suggestion; I shall give it a trial.

DR. EDMUND NOYES : This is a very large subject. It is difficult to tell where to begin in it or just what most needs to be said. The cases vary so infinitely that while everything that has been said to-night may be true in respect to certain cases and under certain circumstances, yet there will be many others which none of these things will exactly fit.

One thing I was glad to hear said, and that was with reference to the disposition so frequently manifested in late writings to cut away freely into perfectly sound tissue. I think that we may be very conservative upon that point, just as surgeons everywhere and under all circumstances should be conservative of interference with nature's plans. Gold is not so much better material out of which to make a tooth that we should hasten to put any more of it in than is really necessary as a substitute for enamel and dentine. This refers to extensive enlargement of small proximal fillings and to a free notching out of grinding surfaces to reach proximal cavities which have a sound, wide, strong overhanging of enamel and dentine that is in good condition. It does not mitigate in the least against cutting out cavities to the very last limit of surface disintegration. It does not refer to the retention of any frail margin of overhanging enamel, which must be cut with great freedom until the walls can be relied upon for strength.

I am old foggy perhaps, in regard to some things, and I might be considered such were I to oppose or discredit in the least anything that has been said here to-night in regard to the use of the matrix or with reference to the combination of gold and amalgam ; but it seems to me that, as a practical, philosophical question, a matrix is not appropriate as an auxiliary in the construction of a gold filling unless in the case of filling with non-cohesive gold which is to be driven down in such a way as to need lateral support to keep it from sliding out of its position. In that way a matrix is often indispensable in the packing of an amalgam filling. If you have the side wall against the matrix you can force it down (that is the plastic amalgam), into a much better adaptation to the walls and use it with less mercury, so as to make in every way a far better operation. In that case it is of indispensable service to

have a side wall which supports the material while it is being crowded in.

The theory upon which gold is used is that it must lie in the cavity so as to be retained. It is absolutely essential that the manipulation of it along the borders and over the margins should be very careful and thorough, and that the portions as they are put into the cavity should stay where they are put without the aid of a matrix or anything else to hold them as the insertion of the filling progresses. That being the case, the matrix is in your way, and cannot be regarded in any other way than as an obstruction that you must work around and against with greater slowness and difficulty than you would do if it was not there.

In regard to the combination of gold and amalgam, it seems to me that if it is an advantage over some other combinations it must be a chemical or therapeutical advantage which it possesses. Amalgam is not mechanically as good a filling as gold; it will not make an operation as mechanically perfect in its adaptation to walls of cavities, nor in its smoothness, accuracy, toughness and permanence of margins. I have not had an observation in twenty years or more of practice that justifies me in the belief that it will preserve teeth at cervical borders any better than gold. So far as I can see, under similar conditions and equally good workmanship, you will find secondary decay at the corners and along the cervical borders of amalgam fillings more frequently than along the same lines of gold fillings, just as we should expect from its being a little less mechanically perfect. Now, there is a combination that can be used under such circumstances that will make an operation as mechanically perfect as gold, and I am inclined to believe has all the advantages therapeutically or chemically that the amalgam has. I mean a combination of gold and tin, or even filling a cavity at that portion with pure tin. I believe cases in which either of these combinations were used have shown greater durability than any other proximal operations I have ever made, and these materials can be packed into a cavity so as to make a mechanically perfect operation. It has never seemed to me that there is often sufficient motive to fill a portion of the cavity with amalgam unless I made the whole operation with it. There is no time or price saved worth mentioning and it leaves the most vulnerable part of the filling with the poorest material, it seems to me. I confess to



being very uncertain in my mind as to some of the therapeutical relations of these materials.

There is one thing more in regard to the general question of restoration of contour. The objection to the operation described by the essayist, if I understood him correctly—making proximal operations so that there will always be a free space between the teeth—is that unless the case is studied carefully and unless one is able to foresee what will take place, the space cannot be relied upon. As a general proposition, to which there are of course numerous exceptions, if a tooth is extracted from the arch, or two of them, or if the antero-posterior diameter of a tooth is diminished, the arch will collapse to that extent; and if a series of operations are made in this way upon a succession of proximal surfaces one in front of the other, there will in very many instances after a while be a close approximation of the necks of the teeth which nature intended should be separated.

The suggestion that the contours of the teeth have relation to the value and preservation of the inter-proximate spaces rather than to the value and use of the teeth themselves, or at least quite as much so, seems to me philosophical. We have all seen a great number of these wide separations which have been successful in an eminent degree. There is no question about that. We have also seen a great number of them in which the close approach of the necks of the teeth was followed by extensive and disastrous decay from the borders of the first fillings to the edge of the alveolus, so that the last state of the teeth was much worse than the first. A contour filling must have strict relation to the solidity and thoroughness of its anchorage with reference to the force that will be put upon it. If a well-contoured filling comes out there is much better opportunity to restore it by a similar operation than there is if one of these flat fillings decays up to the alveolus. The liability of contour work to break down under the forces of mastication is an objection to it, but to my mind a trifling one compared with the great advantages of the work. Of course contouring must be done with good sense and judgment, and I have no doubt you have seen many cases that were over-contoured, in which the grinding surface was so shaped that the masticating leverage upon it was much greater than was necessary. The essential point of a contour is that it should touch its fellow tooth at a point far enough away from the grinding surface to be subject to as little strain by mastication as is

consistent with attainment of the primary object. The special motive for contouring is with respect to the maintenance of the teeth in their proper positions, preservation of the interproximate space, and the separation of the cervical borders and the portions near the cervical borders of the fillings from their fellows so as to allow cleansing thoroughly of that portion most likely to be subject to secondary decay.

DR. T. W. BROPHY: After listening to the paper, there is a good deal in it that I can approve of and some things that I cannot endorse.

While Dr. Allport was on the floor, a thought occurred to me as it has on previous occasions, and that is the necessity of keeping pace with the times. Dr. Allport made the statement in the presence of this large gathering that he had learned a great deal here this evening. You all know that there are members of the profession of his age who have almost ceased to be useful, and to take \* an active part in society work. Is it not true that such men do not keep pace with the times? They become less efficient as they advance in years. I think one of the most impressive lessons that can be taught young men is the necessity of work, not only in the direction of their life-work, but work, work, work constantly and work as long as they live if they expect to achieve the highest object in the pursuit of their chosen calling and associate with others.

There is one statement made by the gentleman who, I think, has just spoken, that he would qualify if his attention were called to it again, and that is in going around corners in the filling of teeth. He does not go around the corner to the extent of filling proximal cavities, where there is not sufficient overlying enamel and dentine to render the masticating surface absolutely strong. From my observation of his operations, I am satisfied that he takes into consideration always the necessity of securing for his operations when completed the greatest strength possible, and does not, nor would I, undertake to fill a tooth around a corner on a proximal surface. If the cavity were in the proximal surface only the enamel above it should be cut away and the cavity filled so as to impart to the tooth the greatest possible strength.

In the matter of retention of gold in the introduction of fillings, I am sometimes amazed to hear gentlemen talk about cutting grooves down around the pulp and proximal surface for the intro-

duction of gold fillings. I regard it in almost all cases as unnecessary. I think a pellet of gold can be put in and so fixed, although I have not adopted the method of holding a piece with the finger, but I can see its practicability, of putting a piece in of sufficient size with a plugger to fix it there and hold it until the other side is fixed, thereby having a retaining point. Retaining pits, in my opinion, should be relegated to antiquity and never again revived except in very rare cases. It is a thing of the past or ought to be at least.

Now, that is one of the advantages of the matrix. What Dr. Allport said he did with his finger can be done with a matrix so easily, provided it is properly constructed. The matrix Dr. Palmer has, may be used successfully, but the position of the matrix upon the model which has been passed around is such that it would be impossible, at least for me, to introduce gold around the cervical border of the cavity and make it overlap so as to make an absolutely tight filling. If I could get the matrix back a little way and the instrument and gold around the border all along the cervical wall to the masticating surface, I could use it. As you see on that model, it is forced by the little clamp or spring against the surface and the cervical wall and is unyielding.

Dr. Jack was the first one to use the matrix successfully, and it had been tried by Dr. Dwinelle, of New York. There may have been others before him. As far back as 1856-7 the *American Journal of Dental Science*, published in Baltimore, speaks of its use. I think Dr. Dwinelle advocated the use of the matrix in filling teeth in 1850. Dr. Jack subsequently took it up and improved it. His matrix was put between teeth and fixed with a wedge and made immovable. In order to improve upon it still further, he had it made so that the cervical border was exposed and the matrix stood below and the gold could be carried over it a little bit. That was a great improvement. To-day the matrix must be adjusted so that the borders are exposed in such a way that the gold can be carried over them. If you fail to do this, you should not use a matrix. Drop it. You must have the cervical borders exposed, so that the gold can be lapped a little and moulded or malleted against the wall. This can be done with soft non-cohesive or with crystalloid gold. There is a prejudice against crystalloid gold on the ground that it is more liable to leak than foil.



In answer to Dr. Noyes, that he does not see the necessity of it in condensing gold, I make this statement, and if he or any one here can show me that I am mistaken I will admit it—I contend that in all proximal cavities a matrix will enable the operator to proceed faster with his operations and he will get the proximal wall as absolutely solid as he would get his masticating surface driven down with a mallet, and when he takes off his matrix he has a solid contoured wall without pits or indentations. He has no finishing to do comparatively; he has no rough surfaces, it is all smooth and when polished with sand-paper disc and polishing strips and rubbed with oil and corundum powder the filling will be as good as can be inserted.

One gentleman said he used very fine pluggers. If I were going to drive tacks I would use a tack hammer, and if I were going to drive spikes I would take a larger hammer, and so on. I have pluggers of the same form, running from very fine to very heavy, and if I am filling a large cavity I use a plugger which will correspond with the size of the cavity. If I have a small cavity to fill I use a small instrument. It seems to me that this is the proper way to do, make the instrument correspond to the size of your cavity. I think a great deal of harm has been done in using too fine pointed pluggers; the gold is chopped up and allowed to crumble.

The remark has been made here to-night about the conservation of tooth substance, and the gentlemen have quoted surgeons. I do not think surgery has any particular bearing upon the method of a dentist in filling teeth. Nerve tissue when divided will unite, and most any other tissue, except arteries. Nearly all the tissues will be reformed, including bone; but who ever saw a cavity in a tooth cured by nature, except when filled with salivary calculus. The surgeon is aided by nature in the cure of disease, but the dentist is dependent upon his own skill for the preservation of the parts upon which he operates. Should he fail in making a perfect operation, does nature step in and assist him? By no means. If he succeeds in making a good honest, skillful operation he may preserve the part upon which he operates, but if he does not succeed in doing everything to perfection, his operation will result in failure, because nature does nothing to assist him.

There has been quite a good deal said on the use of amalgam and gold in combination in the same cavity. I am not prepared to

express an opinion one way or the other upon this subject, and as I grow older I get a little more careful about expressing my opinions. I think we are too apt to approve or condemn without sufficient consideration. It may be an ideal way of filling teeth, it is not the first time I have heard it advocated. It occurred to me that it is a slipshod way of preserving teeth. I have put amalgam in a tooth, allowed it to set, and at a subsequent sitting of the patient, completed the filling with gold; but whether it is the proper thing to put amalgam in and then work it down as one of the gentlemen has stated, I do not know. I hope it is better able to arrest caries at the cervical border and prevent its recurrence after the extensive operations that we sometimes perform than we have heretofore been able to do. I think a great many failures at the cervical borders result from imperfect finishing, from overhanging edges that are not properly finished, from imperfect preparation of the cavity, not having the borders of the cavity smooth and beveled so that the gold when condensed will not pulverize, etc. In my opinion the secret lies in most cases in the preparation of the cavity. The cavity should be properly prepared, beveled off and rounded, and sharp corners should never be present. When we thus prepare a cavity we can put in a filling and be almost certain of having a good result.

DR. ALLPORT: I fear that Dr. Brophy misunderstood my remark in regard to conserving as much of the tooth substance as possible. I am just as well aware as is Dr. Brophy that nature does a great deal in the restoring of soft tissues, and I do not think his remarks apply to what I said. I stated distinctly that all unhealthy tooth structure should be removed, and it is hardly necessary for any one to state to this society that the tooth is destitute of the recuperative power that other portions of the body have, and that therefore all the diseased portion of the tooth should be removed. But because it has no recuperative power, as much of the healthy tissue as possible should be retained, and a skillful dentist can save a good deal of the tooth structure that a clumsy operator would cut away. This is the point I make and I believe it to be correct.

While I am on the floor I wish to say a word about the matrix. We all have, I presume, particular skill in doing certain things, and I presume one reason why I do not use the matrix is because I have not sufficient skill to do it as well as Dr. Brophy does. Yet,

I have tried a great many times to use it and have usually succeeded in making very passable operations, but with few exceptions, not as good as I could have made without. I presume I might learn to use it better than I do at present, but I regard the matrix in the hands of an ordinary operator as a very dangerous appliance, for he will be apt to think he has made a good operation simply because the matrix holds the filling in place, and I do not believe the ordinary operator can make as good operations with the matrix as he can without it in ordinary cases, nor do I believe that the same amount of skill will make as good an operation by the use of the matrix as can be made without it.

DR. NEWKIRK: It seems to me that a great many gentlemen have got the idea that I fill teeth with very fine instruments and small pieces of gold. That is not so. What I meant to convey is this, that in starting a filling I want some fixed point to commence my filling. I feel then I have something upon which I can rely.

DR. J. G. REID: I want to say a word or two about the matrix. I do not know whether I can illustrate it or not, but I will try to. One-half of the matrices on the market are not of much value. I believe a matrix should be made to suit each individual case that is presented for operation. I think our work can be more satisfactorily done. The operator, if he is any kind of a genius, can make matrices to suit his cases better than any that are at present on the market. That has been my experience in the last two or three years. One thing is essential in all cases, viz: Have space enough to apply them in the first place.

The point Dr. Brophy made of having all of the margin of the cavity exposed, is proper, and it is one of the most important features. What I desire to call attention to is that the matrices we have now are too large; they obstruct the view of the cavity and this is the principal reason why I advocate and advise dentists to make their own matrices. (Here Dr. Reid demonstrated on the black-board how large and small matrices should be used.)

Resuming, he said: A matrix that covers the cavity completely up to the crown of the tooth, obstructs the view of the cavity. I don't care whether it be a mesial or a distal; if it is a mesial it is worse. I claim that a matrix should rest as much as possible on the outside of the cavity and not touch the lateral walls or cervical margin. If you can make one, you can make it do that invariably.

DR. A. W. HARLAN: I want to make one suggestion: There



is certainly a class of pulpless teeth in which retaining points are very easy to make, and these are in cuspids and some of the bicuspid, and they render the fillings at certain points much more secure than cutting away the tooth and thereby weakening the tooth structure.

Dr. Louis Ottofy then read a paper on "Rubber Dam." \*

DR. EDMUND NOYES, in opening the discussion, said: The essayist has left little to be said except to amplify the details of management and methods of applying rubber dam, and the many tricks and devices for overcoming the difficulties we continually encounter in its use. Careful operators now make use of it for almost all operations. It is especially necessary if it can be applied without unreasonable trouble, to use it every time a pulp chamber is opened for any purpose of treatment or filling root canals. The reason for it, in a single word, is that in average mouths, under ordinary circumstances, in a city like this, pus microbes can always be found. If work is done in a pulp chamber without the exclusion of the fluids of the mouth, there is certainly danger of infection of the pulp or of the tissues about the apex of the root, unless it is kept continually under the control of an antiseptic. It is always better to avoid infection than to depend upon a disinfectant after it has occurred. It is my opinion that very few cavities should be prepared for filling without applying the rubber dam and securing it as the first step in the operation; at any rate, after the simplest and easiest opening of the cavity or such preliminary work as may be necessary in order to conveniently apply it. The most important reason for that is, that the preparation of the cavity can be done so much more rapidly and certainly, the condition of the dentine upon which we are at work is more readily visible to the eye, and the certainty of accomplishing what we desire is thereby greatly increased.

There are some instances in which the application of the rubber dam is more difficult and will take more time, pains and worry than it is worth, but in my opinion they are very rare. Of course, there are operations which cannot be undertaken without the use of the rubber dam. It must be applied to them at whatever cost. In case it cannot be secured so as to make the operation we prefer, we may be obliged to change the character of the operation in

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\* To be published in 1891.

consequence. With the help of an assistant who has had some experience with patients, there is scarcely a case calling for an operation upon which the rubber dam cannot possibly be applied. There are a few teeth not yet erupted which are exceedingly difficult, but most of them are far easier than they look before you begin, because in a large proportion of these cases a ligature or a clamp can be carried down to the neck of the tooth so as to be retained. The means of applying and retaining the rubber dam are considerable in variety, and every dentist acquires the habit of using a certain number of them and some are used to the exclusion of others, but I think most of us are obliged to have a considerable number of methods and appliances in reserve and resort to one or another as may be necessary.

In almost all instances I prefer to apply rubber upon teeth in the back part of the mouth—molars, by first tying a ligature with two beads around the tooth, and if the rubber is carried down under them it can be relied upon to stay. In my own experience I have not found that a painful operation. It seems to me to average far less so than the application of a clamp, which is a source of very great annoyance after it is placed. If the application of such a ligature does prove painful it can be controlled by carrying around the margin of the gum a little cocaine and waiting for perhaps two minutes. A ten per cent solution I think is the proper strength to use for such a purpose.

I think most of you know my decided preference for the control of the rubber dam and the maintenance of the space between the teeth for proximal work by means of orange wood wedges, and I need not say much about that, except to repeat the special reasons for their use. It can almost invariably be forced above the margins of the cavities so as to expose the cervical border to full view and clear light. The light wood reflects light and makes the cervical border open to distinct vision, and it maintains the space during the operation which would otherwise be contracting continually.

In many cases probably the same thing could be accomplished with a separator, but, I think, not usually any better, and I find a separator in my way. Perhaps it would not be if I used it more. The painfulness of this operation is also mitigated by using a ten per cent solution of cocaine upon the gum previous to the driving the wedge. It will reduce the pain for the most part to that caused by the strain upon the peridental membrane, which must be about

the same as that produced by the separator or any other means of doing the same work. One of my reasons for using beads upon the ligature instead of depending upon the ligature alone, is that I always desire to put some strain upon the margins of the rubber dam to get it out of my way, and to open the mouth and cavity to light, and I don't want to feel that the ordinary strain from my fingers or from the movements of the lips under the rubber will pull it off from the tooth. There are many instances in which nothing need to be used except to turn the margin of the rubber under the free margin of the gum, so that the tendency of the rubber will be to slide toward the apex of the root in the direction which its natural conical form tends make it go, and all the pain and annoyance and time of applying ligatures may be avoided. That will oftener be the case upon the bicuspid. Sometimes the tendency to pull out from the space behind the tooth being operated upon can be controlled very readily and admirably by a little clamp which Dr. Swasey has made for that purpose, or the same thing can be done by a bead on a string, drawn through until the bead occupies the space between the necks of the teeth.

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#### IOWA STATE DENTAL SOCIETY.

*(Continued from page 893.)*

In the course of a discussion of a paper on "Pathological Conditions of the Ethmoid Bone, Resulting from Dental Lesion,"\* DR. INGERSOLL said: This subject is so extremely new and so important that the discussion cannot very well be entered upon immediately. I want to say we have with us Dr. Sudduth, of Philadelphia, and Dr. Harlan, of Chicago, who have experience on this wide question and know something about it, and I would like indeed if they could be called upon.

DR. SUDDUTH, Philadelphia: It is a fact that has been long known to medical men, that the ethmoid bone does become diseased in some conditions of nasal catarrh, and that certain brain lesions result from these diseased conditions. What Dr. Wilson has called attention to, is a new thought to me. That is, that in

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\* See page 505, DENTAL REVIEW, 1890.



connection with diseased antra you may have this same condition arise. I have had no personal experience in that connection, although I have had some experience with diseased ethmoid bone in nasal catarrh.

DR. HARLAN, Chicago: I had the opportunity of reading Dr. Wilson's paper this morning and I thought while reading it, that he had been able to introduce a new phase of this subject by associating it with diseased antra. An Irish lady of about 40 years of age, had been unsuccessfully treated for nasal catarrh for a number of years, and on being directed to me for an examination of her teeth, I could only discover the right lateral incisor to be pulpless, and at first thought I would do nothing with that, but boring into the pulp chamber, I concluded to try the effect of jogging something through the root and see where it would go; see whether it would go into the nasal cavity or into the antrum of Highmore. As the fluid passed through the root it entered the antrum and finally discharged from both nostrils in the same way that Dr. Wilson has described. This case progressed very favorably, and at the end of four months was cured. Then the patient was referred back to the physician and he was able after a time to arrest the further discharge and, aside from the influence on the voice, no one would have known that a disease of that kind had been present. I am satisfied that the literature probably is more full of reference to conditions of this kind than Dr. Wilson has found, as in nearly every work on rhinology and post-nasal catarrh, etc., references will be found to pathological conditions of the ethmoid but none with reference to the connection, or probable, or possible connection of disease in the antrum of Highmore. I think it is a subject that should receive more attention, and especially from dentists. Wherever there is a case of antrum disease that is stubborn and resists their usual mode of treatment, they should undoubtedly consult a specialist in this line, and they will both be benefited, and I am certain the patient will be.

DR. A. H. THOMPSON, Topeka: I have had but little experience in the treatment of this form of disease. In the few cases of abscess of the antrum which I have treated, there happened to be no nasal complication, but I can readily see how such troubles are caused in the manner in which Dr. Wilson has described. I am sure the paper has been very instructive to all of us, and as Dr. Harlan says,

it will be beneficial for both ourselves and specialists to act together in the treatment of such disease.

DR. INGERSOLL: This is entirely a new feature of dental disease to me. It explains, I think, some difficulties I have had in treating diseases of the antrum, which I should never have suspected. It is however, a question in my mind, which was the primary disease: whether it was nasal catarrh primarily, greatly aggravated and carried on by the dental lesion, producing its influence on the antral cavity. I am struck with the peculiar feature in all such cases—which ought to be a lesson to every dentist—it enlarges so very greatly the field of our work as dentists. I have been led to notice this in a number of instances in the past two years. The fact is that in the early days, and even to-day among a large class of men, the teeth are supposed to be as foreign from the human body as a set of artificial teeth. We treat the teeth as independent organs and not as something intimately associated with other organs; not physiologically but pathologically, and more especially pathologically. I read of most remarkable cases recently, resulting from dental lesions. This now is another remarkable case. I have had such cases, but never suspected them to be connected in any way with the ethmoid bone; I knew they gave me difficulty and I treated them somewhat as antral disease, but I am satisfied now that the disease spread much further than I had even suspected, which will account for the difficulty in the treatment. We need to know that wherever nerves pass from one section to another, through that entire range we may have disease; pathological condition will go wherever circulation and nerve go; we do not know the limit; we occasionally find some such remarkable case as this or even more remarkable, and it should teach us that we are not through with dentistry, when we have simply operated upon a dental organ; it goes away beyond; and the more critical our observations are, the more we shall see that we know very little about dentistry. It is astonishing to me, that I should have lived in ignorance so long; there are so many of these pathological conditions; they come up one by one. As I have said during the last two or three years, most surprising cases occurred. Disease of the eye, disease of the ear, disease terminating in neuralgia of the most distressing character, and spinal disease. A case which I related a few weeks ago was one of the most distressing cases of spinal disease.

lasting for several years and was corrected by a dental operation entirely.

DR. E. H. ANGLE, Minneapolis: I have not had sufficient experience in that class of disease to offer anything in addition to what has already been said. I was much interested in the paper and will try and profit from what I have heard.

DR. A. H. THOMPSON: Another suggestion occurs to me in regard to the connection which is nearly always seen between nasal catarrh and pyorrhœa. I believe that Dr. Patterson said that pyorrhœa is a catarrhal disease, and we so often find—in the majority of cases—that severe pyorrhœa is accompanied by nasal catarrh of greater or less intensity. Of course, the presumption is that the nasal catarrh was the original disease. We can hardly assume that the pyorrhœa would be the cause of the pyorrhœal condition of both the cavities. I do not know that I would say that there is a catarrhal diathesis, which would lead to disease of that sort in the pyorrhœal region and in these localities, but it seems sometimes as if there is such a thing when it comes to the treatment of obstinate cases of pyorrhœa, and I believe it would be worth our while in these obstinate cases to have a patient examined by a physician or pathologist to see if it is not accompanied also by catarrhal condition of the nasal cavities. If that is the case, we would not reach the origin of the disease. You have also noticed that those persons have that disagreeable catarrhal smell, which we, when treating, so often notice, and know it comes from a catarrhal condition.

DR. E. C. FRENCH: I have made close observations to notice whether pyorrhœa is of a catarrhal condition. I think that I have seen several cases of pyorrhœa where I did not discover any catarrhal condition and I have seen some cases of catarrh that seemed to me as bad as could be, in which there were no traces of pyorrhœa.

DR. M. G. JENISON, Minneapolis: I have in mind a case, illustrative of dental irritation as a primary cause. The case came under the treatment of Dr. White and myself. When the patient presented himself the left cheek was very much swollen with two openings through the tissues externally, and one above the bicuspids, internally; the roof of the mouth was swollen and there were two fistulæ in the upper eye-lid. According to the history of the case he was first troubled with catarrh, which was treated with what he said was snuff; this, it appears, had the effect of closing



the antrum into the nasal cavities, causing soon after, the swelling in the cheek. The physician having the patient in charge kept the cheek poulticed with flax-seed for six weeks, resulting in these openings through the tissues. The primary cause of the trouble was from the first left upper molar, resulting in necrosis of the alveolar ridge, involving the three molars; the penetration of the upper wall of the antrum, into the orbit, catarrhal condition of the inner wall of the orbit and these fistulous openings through the upper eye-lid. The inflammation and irritation in the tissue of the orbit affected the eyesight to a certain extent. Free drainage was established from the antrum; this was done by the removal of the necrose bone, opening the entire lower portion of it; after careful cleansing for a few weeks, the case entirely recovered, the treatment requiring about three months before the patient was entirely well.

Dr. Harlan, of Chicago, then read a paper on "The Use of Diffusible Medicaments in and around the Roots of Teeth."\*

In opening the discussion Dr. I. P. Wilson said: The paper just read has been to me one of exceeding interest, and yet I am inclined to question the correctness of the conclusions reached from the experiments that the essayist has made. In the first place I would say that I fully agree with all that was said regarding the discoloring of teeth from the extraneous matter deposited in the dentine; the point that I question is in regard to foreign matter, or the gases passing into the cementum. Now the experiments go to prove that that is the case from the stand-point of the writer, but we must take into consideration the fact that the tooth has two sources of life. The dentine has one source, the cementum another; the dentine's source of life is from the pulp. Now as we are treating teeth and filling them, there is life in the cementum; there is this vital force there warding off the gases or dangers that may approach; and that is a great power. In the experiments made the tooth was dead; it is not simply a pulpless tooth with the pulp and the dentine dead, it is one with the cementum dead also, and it seems to me that there is then no resistance to the preparations introduced into the canal, and it would quite readily pass through both of those structures. That there is a communication between the dentine and cementum there can be

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\* See Page 466 DENTAL REVIEW, 1890.

no doubt, but when we remember that applications of arsenious acid will stop at the line between these two structures, it seems to me we must conclude that nature has the power to prevent the encroachment, or rather that the agent has not the power to pass beyond that line. The devitalizing effect of the arsenious acid stops at that line; it does not go beyond as a rule; it should not do it, except it be at the apex of the root where the cementum reaches down and surrounds that portion of the pulp that is just passing out from the tooth. There is a point there of course, where no dentine intervenes. I can see how the gases may be thrown out at that point if the pulp is destroyed. The canaliculi in the cementum at the apex may become infiltrated and dead at that point, but above that even if the dentine is not living the cementum must remain alive still.

DR. INGERSOLL: I agree with the essayist in his objection to the use of coagulating agents as destructive of the very purpose intended in the medicament; but it seems to me that he has brought us to a different conclusion in regard to the difference between odors and disinfectants—the property of odor and the property of disinfection. Some of the best of all our disinfectants are without odor. Now is it certain that wherever odor goes there goes disinfection? They are two very different properties. The conclusion he has arrived at is, that from the fact that the odorous agent passed out through and was found in the plaster of Paris, therefore the disinfecting property passed through also. I do not think that is a logical conclusion by any means. We need to have more proof of that, because the odor is a distinct thing from the property of disinfection itself, so distinct that there is no proof, no evidence whatever, that the disinfection passed because the odor passed.

DR. THOMPSON: I was greatly interested in the paper and in the experiments also. The idea occurred to me as it did to Dr. Wilson, that there is danger of too great diffusion of the medicaments, which he uses on account of their diffusible qualities. I have been one of those who have always used coagulants by preference. I am not sufficiently versed in the materia medica and therapeutics to combat Dr. Harlan on that subject, but it seems to me that there is a place at which medicaments should be limited. The coagulants are self-limiting, as he says, and for that reason they have their advantages. If putrefaction has not gone far into the

dentine, it seems to me that a coagulant would be indicated, which would limit the progress of further death and decomposition. The communication between the cementum and the dentine will preserve the life of the dentine to some extent, and, of course, the more life that can be preserved there the better.

DR. WILSON: I would like to ask Dr. Thompson a question: Did I understand that he believed there might remain life in the dentine after the pulp was dead?

DR. THOMPSON: Yes; in the outer portion of the dentine in contact with the cementum.

DR. WILSON: What evidence is there of that?

DR. THOMPSON: No evidence; the opinion is merely theoretical, just as the rest of it is.

DR. CROUSE, of Chicago: Now, Mr. President, on the subject of disinfectants, I think myself that Dr. Harlan is a little bit cranky on the subject of the material that will give the biggest odor. For my part I think the preparation of per chloride of mercury is one of the very best things to destroy odors about the teeth. I think that is particularly apparent, as there was no odor that I could detect. It has one disadvantage—it uses up the broaches rapidly; it destroys steel very rapidly, and for that reason has to be used carefully. I have not found anything that per chloride would not use up.

I have disinfected root canals a great many times with carbolic acid. I know it is claimed that it does not disinfect, but there was a time when everybody used it. I think, however, its use is objectionable, being a coagulator at the first application to the small root canals which become clogged with the coagulum, making it more difficult to enter them afterward.

DR. SUDDUTH: In regard to the general subject of disinfecting pulp canals, I do not believe that it is generally understood, and medicaments are used for the arrest of a process of germ growth. There are four things essential for the development of germs. First, a living germ; second, a suitable media; third, a high temperature, and fourth, moisture. Now, if you destroy either one of those four conditions you prevent further infection, and I claim that any method that is used to destroy any one of those four conditions is as complete a disinfectant as is necessary in dental practice. The mechanical extirpation of the pulp and the cleansing of the pulp canal is the first step toward that process. You have



removed the majority of the germs found in that canal. Then, if you dehydrate, that is, if you thoroughly dry that canal, you have performed an important antiseptic treatment. Any means that will thoroughly dehydrate the canal may be resorted to ; then fill it so that no moisture can again penetrate. If that canal is thoroughly dehydrated and filled with any agent or not filled at all, provided the decay in the crown is filled, you will never have any further trouble with that root.

If you can fill the apex of the root canal and put it in such healthy condition that nature can bridge it over with cementum you have that point tight continually. It is not necessary to drug with diffusive medicaments or bichloride of mercury, or otherwise, provided you cleanse the canal as well as you can and dehydrate it.

DR. INGERSOLL: I would like to ask Dr. Sudduth one question. He speaks of dehydration, or rather moisture as one of the essential elements for the development of germs. Suppose you had dehydrated, do you think this would necessarily destroy the germs?

DR. SUDDUTH: No, you inhibit their further growth until they receive more moisture.

DR. INGERSOLL: When the normal moisture returns to the tooth will not the germ life return?

DR. SUDDUTH: If you dehydrate the canal and seal the foramen you will never get any germ in the canal ; there is no diffusion of moisture—that has been demonstrated to my knowledge—between the pericementum and the pulp canal of the tooth ; or, if there is, it is to such a slight an extent that if it could be possible it would not accomplish the object of germ growth.

DR. INGERSOLL: It seems to me certain that there is considerable contraction in the dental substance of a tooth after it is removed from the mouth, showing that it is in a moist condition in the mouth so long as it remains there. These germs may stand any amount of dryness just as various insects come through a long winter, dehydrated by the frost, and also perfectly dehydrated seeds, germs of various plants and animals in a state of dehydration, but when moisture comes again they revive and I do not see anything to prevent any germ in the tubuli reviving when moisture comes in contact with the parts again.

DR. I. P. WILSON: I would like to ask Dr. Sudduth one question. While I cannot fully endorse what he has said, yet this question arises in my mind. If a tooth is extracted and after a

time the root is filled, put in good shape and implanted, but before implantation the tooth is too light a color, it has been out of the mouth until it is entirely dehydrated; but when put back in the mouth—the apical portion having been sealed up perfectly,—through what means does it become again the color it originally was?

DR. SUDDUTH: I see I have been misunderstood. I do not deny the impossibility of the tooth imbibing moisture to a certain extent, but that sufficient moisture will pass through that tooth to the canal to again revivify those germs, is the point I deny. Now, I do not say how I would dehydrate that tooth; my process would be to use a white heated platinum broach, which, in itself, would destroy the germs confined therein. That is the process I have advocated for dehydrating pulp canals, and those platinum broaches are made now so that they may be heated by electricity and have everything else adapted for the purpose.

DR. A. W. HARLAN: I have been through a good many wars, and the trouble with a good many people is that they do not understand the subject themselves. In the very beginning of my paper I excluded from the class of teeth that diffusible medicaments were to be used in those where the pulps were purposely destroyed, or destroyed by accident or before any putrefactive changes had begun, and took up only the question of the disinfection of dentine and not cementum. I stated that right through the paper; disinfection of the dentine.

DR. I. P. WILSON: I understood you, Dr. Harlan, if you will allow me to say, that the gases were forced not only through the canals in the dentine, but also into the cementum through the canaliculi, destroying that structure also.

DR. HARLAN: I will explain to you how that occurs. You have a central incisor tooth to fill, in which the pulp has been dead and decomposed, and after particles of everything imaginable has gained entrance to that canal, we will say through a cavity in the crown. You find that there is a fistula on the gum; there has been an abscess established and the pus is discharging through that; you say to yourself, I will fill this tooth; there is a proper case for immediate root filling. So you adjust the rubber dam, cleaning out the contents of the canal and force some medicament, I do not care whether it is a diffusible one or not, and that goes through, occupying ten, fifteen or twenty minutes, and you fill the root. Now, in that

case, you would not have procured, or established, or made complete the disinfection of the dentine that was thoroughly permeated by the gases of decomposition, because, on account of the denseness of it and on account of its insidious and long continued entrance into the dentine probably it has massed, if you please, directly against the abutting cementum. Now, we will just wait. You fill that root and you fill the crown, and in four or five years, or three years, or ten years, it don't make any difference the number of years, every time that person sits in a draft or makes an unusual use of that tooth, or they get their feet wet, or they are a little below tone, that tooth they are sensible of. Now, what brought about that condition of things? Simply mephitic gases which are not destroyed by the passage through the tooth of the medicament that went through and out at the fistula, acting as a continuous irritant on the cementum, which, in turn, affected the pericementum and caused its thickening and protrusion of the tooth, etc. Of course, I cannot show that right here, but I say inadequate disinfection will result in the gradual enfeebling of the vital resistance of the cementum and a still more gradual enfeebling of the pericementum. There is no practitioner in this room of twenty years' experience who does not know that pulpless teeth, no matter how well the apical ends are filled, if they are filled under such circumstances, are a source of discomfort in time, to their possessors.

DR. HUNT: If I understand you, the point is that after removing the contents of the canal you still have the mephitic gases in the tubuli of the dentine?

DR. HARLAN: Yes, sir.

DR. HUNT: And the mouths of these tubuli are open into the main canal?

DR. HARLAN: Yes, sir.

DR. HUNT: What would prevent the gases escaping through the canal at the time of treating the tooth?

DR. HARLAN: Nothing to prevent that, except the mere fact that gases lodge in caverns and there is no possibility for them to escape except time be allowed and you would not keep the rubber dam on the tooth a sufficient length of time to permit of that sort of disinfection, or aeration, if you please.

DR. HUNT: You speak of the discomfort that the patient experiences after a tooth of this character has been filled, describing one with a fistula and immediate root filling—speak of discomfort



following the treatment of a tooth in that manner. In the establishment of fistula it would seem to me that we also have a condition of the connective tissue, or peridental membrane—the question would be how long after the immediate root filling before that condition would recover its normal tone; how long would that probably be. And the point that you made was—I want to take a little issue of that because I do not understand how those gases in the main canal when open, would fail to escape, from the tendency of all gases to expand and find a proper ventilation in that way, and I still further think that following the immediate root filling it is questionable how long before the tissues would return to a normal condition, particularly when a fistula has been established.

DR. HARLAN: Dr. Hunt's last speech is involved in so much obscurity that I cannot undertake to reply to it, because he does not see the point that I am making; he fails to comprehend what I have in my mind, so I will dismiss that, for the present, and return to Dr. Ingersoll. Dr. Ingersoll says that odors having passed through a tooth and gone into the plaster of Paris is no proof that the disinfectant has also gone through. If Dr. Ingersoll will recall for an instant some of the things that are already proven, that there is no essential oil that does not contain a camphoraceous body and that the camphoraceous body developes at a temperature of about 94 degrees; that if the temperature is raised higher it ceases to be volatile and will become a solid, and consequently there is an absolute certainty that the volatile camphors, which are given off from the essential oil at that temperature, which is a temperature below that of the human body would thus—being vaporizable, have gone through where any odor would have penetrated. The presence of cinnamic acid in some amount is also conclusive proof. I may be pardoned, but I read a paper before The International Dental Congress of Paris, in which there were a large number of experiments reported, but of a little different nature from these, where more definite chemical tests were made which, when published, will prove more conclusively than these experiments have that these volatile camphors are diffusible through dentine. Dr. Thompson says that coagulants are good things. Why, of course, they are. I do not dispute the value of coagulants. I say that they should not be used in places where they are not indicated. Everybody has run to coagulating medication. I am the first man in the United States who has publicly fought this question and

opposed it and tried to give reasons for it, and shown experiments for it, and I know from what many gentlemen have written to me and from what many have said to me that they feel they are doing better work in the practice of dentistry; especially in the retention of pulpless teeth that were hitherto considered almost useless, by adopting a system of medication that would provide for the most complete method of disinfection of dentine. This is no new thing with me. I consider it a great compliment, Mr. President, to be invited by the chairman of your executive committee to read a paper before this society. I undertook all of these experiments solely for the purpose of bringing this question before you and I am a thorough believer in it; and I tell you now that there is going to be a complete revolution in the practical treating of pulpless teeth—well dating from a few years back. It is growing slowly, but it is growing. The day has passed when every tooth must be doped, and packed, and injected with carbolic acid and chloride of zinc and agents of that class because they have been proven to be self limiting, and if disinfection amounts to anything, if dentine can be polluted it must be disinfected with substances that will not prevent its own ingress or its own influence to be felt in that dentine.

With reference to the remarks of Dr. Crouse—well, he has gone. I am not an advocate for the use of disinfectants that have themselves an odor. In the paper itself I referred to many, because I believe in them. I prefer, as a matter of fact, agents for disinfection that are themselves odorless, if it is possible to use them; but there are many cases where it is not advisable to do that.

In regard to Dr. Sudduth's remarks relating to dehydration, how are you going to get perfect dehydration of the tooth? That is just as theoretical as many other things of this kind are. You might do it outside, but you cannot do it perfectly, and just as Dr. Ingersoll said, as soon as the normality has returned there will be moisture there again, and if the whole root canal of that tooth is not then filled solidly with something that is not an absorber of gases, why these microbes that live without air—well, what will they do? I have spent a good deal of time, not experimenting with microbes very much, but with subjects analogous, and I have followed all the experiments of their best men, and if there are bacteria or microbes, or any other minute organisms dry in a tooth and moisture afterward gets through and they get the warmth, and all

that, why may they not go on and excrete their ferments, if you please, and when there is no longer space for the gases that are given off during this period they must do something? Will the microbes die in the excess of their own excrement, or will the gaseous products pass on and enfeeble the cementum? Well, perhaps that is a very fine point; I don't know how we can prove that. But, perhaps that will go on; I do not say—I cannot say that dehydration is not the most complete method of disinfection, but how can we procure that by introducing the platina probe? How will that attract all of the moisture from the dentine? How do we know that it is going to destroy all of the microbes? How do we know but what there are little pockets along the dentine in the interior of the root where this probe will not touch and where the influence of the heat that passes through it will not be felt. Those of you who have made cuttings of teeth showing the irregularity of pulp canals, etc., know how impossible it is to expect the interior of a root of a tooth to be uniform, to not have inequalities and shoulders, and all that; and who is not aware of the fact, as has been said already this evening, that there is more than one foramen of the apex of a tooth? How are we going to prove that we have secured complete dehydration? It is theoretical, but I believe it is correct.

A paper on “Cements in Dental Therapeutics,”\* was read by Dr. A. H. Thompson, of Topeka, Kansas.

The discussion was opened by DR. HUNT, who said: The paper treated very clearly and forcibly of the importance of cements in dental practice. In regard to the uses of oxychloride in teeth with a live pulp, I believe that, if I want to improve the density of the tooth substance, or, in other words arrest the condition that was producing the softening of the tooth substance, I would much prefer the oxychloride; but I should want to use it with considerable care. The oxychloride of zinc, at least the chloride of zinc, is pretty well suited chemically in its combination with the oxide of zinc, and is safe unless it is very near to the pulp. I do not believe that any serious danger will result from the effects of chloride of zinc, except where there is a near approach to the pulp, as there would be also with the oxyphosphate of zinc, we would have the same result with a metal filling; and we would have it if any for-

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\* See page 512 DENTAL REVIEW, 1890.



eign substance was placed near the pulp. The therapeutic value of chloride of zinc is certainly greater than that of the phosphoric acid, the oxide of zinc in either preparation playing little or no part.

One point in regard to the permanency of cement: We do find that it gives better service in some mouths than in others, but I apprehend that a good deal of this difference is due more to the fact that in all cases we do not have the proper conditions under which a cement can crystallize. We are more likely to find cement deteriorate sooner if we allow moisture to come in contact with the cement before it is sufficiently hardened. We are apt to think that the cement is set completely or fully crystallized, when we find by touching it with an instrument, or testing it in any other way that it seems to be hard, or at least hard enough that it would bear trimming or manipulating with the burnishers, but the cement by no means is in a crystallized state. It has not completed the process of crystallization. In using phosphates we would get more permanency if we would use greater precautions to prevent moisture for a longer time after inserting a filling; leaving it say twenty-four or thirty-six hours, protecting it completely, and I do not know that it is new to any one, but the method I have always adopted in using cement fillings where I desired the benefit of the filling was after inserting it, to coat it over with a solution of gutta-percha or chloro-percha. You can use the pink, but in the front of the mouth sometimes, that is unsightly; but the white can be dissolved in chloroform the same as the pink and you get the same solution exactly; I find even after two or three days the filling will still be coated entirely with the gutta-percha filling and it can be dressed down. I find following this practice less disintegration of cements. In crown and bridge work, and work of that character, we find more difficulty on account of moisture. I am satisfied that the reason of the giving out of cements in this connection is not due to a want of absolute dryness of the cement underneath the band at the cervical margin. We get an exudate of mucus from around the teeth and from below the gum and in that region where we do not detect it.

I am quite certain of the fact that where absolute dryness can be obtained, that a piece of this kind with an open band cemented on a tooth is quite as durable as when a closed band is used. But I am also quite certain of the fact that there are very few cases

where we can get absolute dryness ; in spite of all our efforts we get exudation and moisture from below. I firmly believe that we have not yet reached the full value of cements in the dental profession. The zinc cements are unfortunate in this : That they absorb moisture readily, even before the liquid and powder are mixed together. It is almost or quite impossible to keep the powdered cement or the liquid—particularly oxychloride—in such a condition that it will not deteriorate from exposure to the atmosphere, for the act of removing the stoppers from the bottle, if you only remove them for the purpose of getting out the contents, will affect it. I place it back as soon as possible and yet, even then they absorb moisture readily and the zinc is deteriorated. If it were possible to have our cement, both powders and liquids, prepared at once and used at once, we would see a very different result in the use of them in our practice. Some one, a few years ago, advised a plan of putting a little liquid and powder in separate small glass tubes, hermetically sealed, with blow pipe at each end, and the glass tubes broken as you want them, the amount of powder wanted for each case being contained therein. They were serviceable, but not convenient to use. But it has been something of a wonder to me that experiments have not been made in other directions in regard to cements, that is, the selecting as the basis substance of something besides zinc. Now, for commercial use, we have an unlimited number of cements that are not zinc that resist the action of the atmosphere and of water and such acids as are contained in water for a long series of years. The only feature about them is the color, but I apprehend if a careful line of experiments was carried on in that direction that we might succeed in getting a different cement entirely from what we have in the zinc. At any rate I hope, perhaps before a great while, to know something more of that, as I am carrying on a line of experiments using the limes—some form of limes—as a basis, and I will say this : that I have succeeded in getting a cement very hard, non-resistant to the action of acid and the alkalis under the very most severe test, but unfortunately it is very slow in setting, requiring three or four hours before it would come to that plastic state so as to be manufactured at all. That is the serious objection. It does not shrink, acids do not affect it, nor alkalis, but it is so slow to set that it could not be used to advantage.

DR. NORTH, Springville, Iowa : In regard to the durability of

cements, I do not claim them as permanent fillings, but the mixing has much to do with the durability of the material. Where we take out a certain amount of liquid and then take out a certain amount of powder and mix them and find the cement is too thin or too thick, and we add more liquid we destroy the crystallization, thus the durability of the material. We must understand or learn to put in a proper amount of liquid and the cement, and they should be mixed; and if in mixing I find I have not the proper amount I try again until I get the right proportion.

A paper on "Photography in Dentistry and Medicine," by Dr. M. G. Jenison, Minneapolis, Minn., was then read. Also one on "Educational Methods in College and Out," † by Dr. W. J. Brady, of Minneapolis, Minn.

There were also papers read on "The Protection of the Dental Pulp,"\* by Dr. L. F. Kellogg, of Marshalltown, Iowa, and "Cast Your Bread Upon the Waters.—Remarks to Young Practitioners,"‡ by Dr. J. T. Abbott, of Manchester, Iowa. Adjourned.

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Dr. W. H. Wilmer, of Washington, recently read before the Medical Society of the District of Columbia, a paper on cases of the latter class. One patient was a boy who had suffered from frequent headaches since he began straining his eyes attending school, and for three days had had a constant dull pain in the forehead and temples. Upon examination a defect of the eyes was discovered, and suitable glasses being given, the headaches stopped. In a second case, an elderly man complained of great difficulty in reading, especially by artificial light, and he also had a more or less constant dull pain in the head, principally in the back part. Proper glasses cured both troubles. Another patient, a Wall Street broker, had suffered for years from insomnia and headache, which extended from the back to the top of the head. Prolonged medical treatment had given no relief other than the production of sleep by hypnotics. Glasses to correct defective vision were supplied, and three days afterward the patient reported that he had been free from headache, and had slept without a hypnotic better than he had for years. Dr. Wilmer adds that as the correction of an ocular error can relieve headache, so the production of such a defect artificially, may cause it. He gives from his own experience an instance of this kind: Some years ago he purchased colored glasses to wear while traveling. For a short time they were agreeable, but in the course of a half hour a headache came on. The glasses were irregularly concave. He says that flat, smoked glasses, as a rule, should be worn if a colored glass is necessary at all.

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\* See page 519 DENTAL REVIEW, 1890.

† See page 569 DENTAL REVIEW, 1890.

‡ See page 956 DENTAL REVIEW, 1890.



# THE DENTAL REVIEW.

Devoted to the Advancement of Dental Science.

PUBLISHED MONTHLY.

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## VOLUME IV.

With the present number the fourth volume of THE DENTAL REVIEW is completed and becomes a part of the profession's literature. We believe that the promises made in the January number have been redeemed and that the present volume is in every respect superior to the volume preceding it. Our readers may confidently expect that no expense or labor will be spared to make volume V. even better than the present volume. The progress of THE DENTAL REVIEW in the brief period of its existence has been beyond our expectation, and we do not hesitate to acknowledge that the numerous contributors in this, and other lands, have contributed much toward success, and that in expressing to them our gratification, we request the continuance of their good will the coming year.

The April number contained a contribution from the pen of Dr. E. G. Betty, of Cincinnati, which can justly be claimed as the most valuable scientific addition made to the literature of dentistry during the year 1890. While the publication of the transactions of the American Dental Association, in the October number, within two months after the adjournment of the meeting, giving the subscriber a volume of 206 pages has never been equalled in the history of dental journalism. The present number contains a carefully arranged table of contents, a biographical and general index, which will be found ample for the needs of the student, practitioner or investigator.

It is with considerable pride that we refer to the fact that the present volume of *THE DENTAL REVIEW* exceeds by 16 pages the amount of reading matter published by any other dental journal in America.

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#### BUSINESS VS. DENTISTRY.

"Dentists are not business men," was a remark made recently in the hearing of the writer, and our every-day experience compels us to acknowledge its truth. Too often the young practitioner in his eagerness to make acquaintances, neglects the many essential details which go to form business habits, and when his practice occupies his time fully, correspondence, prompt presentation of accounts, the keeping of a daily journal of expenditures and receipts, &c., &c., are matters entirely overlooked. The business man attends to his correspondence promptly, his bills are rendered with regularity and if not paid within a reasonable time, a collector takes charge of them and the debtor gets very little opportunity of forgetting his indebtedness. The dentist may send his bills out regularly the first of each month, but he sometimes says to himself "Mr. So and So's all right, I guess I will wait a few days longer, or he may think I am dunning him," and as a result Mr. So and So does not pay his bill till several months have elapsed, and then he thinks just what the writer heard said. How many dentists keep account of their daily expenditures and receipts? A patient has a tooth extracted and the dentist pockets the fee and forgets all about it. He pays out a dollar here or a dime there, in the same manner and no memorandum is made of it, so only by the fullness or otherwise, of his pockets can he tell what the volume of his practice is. This is not a pleasant commentary on the profession, and these things could easily be avoided by a slight change in business habits. The new year is near and is an auspicious time for new resolutions and "new leaves." Why not buy the books and start out January 1st, 1891, to become business men as well as professional men?

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#### CRITICISM OF THE AMERICAN DENTAL ASSOCIATION.

Fair criticism has a wholesome effect whether applied to books or to kings. Recent issues of a neighbor dental periodical have given utterance—editorially and through a correspondent, masked behind the pseudonym, "One of the 90"—to strictures upon the

management of the American Dental Association. Also by implication if not directly its officers are charged with seeking their own advancement, at the sacrifice of the modest many. The lugubrious prophesy is then made, that all this will eventuate in dissolution of the national body. The reasons why this is unjust criticism, are plain enough to those who are familiar with the workings of the association. For instance, any one who attended the Excelsior Springs' meeting will know that its proceedings were on a par with any previous year, and that the papers were above the average in scientific value. The published transactions are ample proof of this. There is a class of mal-contents which seem to be common to all organizations of men, from whom any criticism almost, comes with bad grace.

This class is well represented by two specimens now in mind, one of whom to our personal knowledge has no permanent membership in the A. D. A., because of unpaid dues—the other has paid dues seven or eight years only, and has attended but three or four sessions, yet they are, both in season and out of season, loudest in traducing the reputation of the society, under the guise of working in its interest, and their criticisms are invariably of the same character as of those referred to. That the association is not above criticism, and in truth needs revivifying, is perhaps best known to those most active in its affairs. But, if it is to be purged and scourged to greater usefulness, it will be by the men who manifest a more honest purpose than is shown in the articles to which we allude.

If those who thus criticise the association and who are so much dissatisfied with its management would take the matter in hand, attend its meetings regularly and organize themselves, they could easily place its control in the hands of those they consider abler and more disinterested, and those now at the head of its management would cheerfully take the back seats—if they could see any hope of improvement.

All associations of this character must have management, and that management will necessarily be placed in the hands of those who show an interest in the organization, who attend regularly and who are willing to do the work, and it may be set down as a rule that members of such bodies always find their proper level in them. Those on the back seats are there because in the nature of things they belong there, and this reference to back seats does not reflect



any discredit upon those occupying them. There are very many who have been members for twenty years and more, who attend with great regularity and are valuable members in their place, but who never dreamed of complaining because they were not made officers. Moreover they do not wish it, recognizing that their gifts do not lie in that direction.

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#### MUCOUS PATCHES.

Mucous patches of the mouth or tongue, when not specific, are frequently troublesome and painful. We have found, by drying them and painting the surface we get very good results, as with the following:

Resorcin, gr. xL.

Aqua,  $\frac{7}{3}$  ss.

Or

Aristol in powder directly to the newly dried surface.

Dr. Geo. H. Cushing has very good results from the use of glycerole of thymol, and lately we have used pyoktanin, yellow, in five per cent solution in water. In very obstinate cases we have used a saturated solution of resorcin in water with the happiest results. Always throw the pencil away after using it in cases of this kind.

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#### TEMPORARY FILLINGS.

The teeth of women during gestation and lactation frequently require filling. Shall we use gutta-percha or oxyphosphate? For a number of years we have given a fair trial to each of the substances mentioned and have in consequence come to the following conclusions: In all proximal cavities reaching the cutting or grinding edges of teeth, we now use oxyphosphate of zinc. In labial or buccal cavities we find gutta-percha most serviceable. In those proximal cavities of molars or bicuspid's midway between the gum and the cutting edge, we use gutta-percha if the cavity be deep—if shallow use oxyphosphate. To fill teeth at such times, with gold or other metals (unless plastic) is a waste of time and such operations are of doubtful value. Fillings of a temporary nature are often required for children and the same general rule may be observed in such cases with markedly beneficial results. All oxyphosphate fillings should be varnished, after hardening, and the varnish should be dried likewise.

## ILLINOIS STATE DENTAL SOCIETY.

The officers and the executive committee of the Illinois State Dental Society for 1890-91 will be responsible for a great deal unless they will make the coming meeting at Bloomington next May a successful one. All societies like individuals have their ups and downs, and the old, respected and honored Illinois Society is not now in the ascendancy. The time is fast becoming short and there is a good deal to be done. As soon as possible, the subjects to be discussed should be announced through the dental journals, so that members, who are specially interested in them may prepare themselves. It should also be the duty of every member of the society to endeavor to add something be it ever so little to make the meeting interesting and profitable. Look up your case book, or think about some phase of our extensive and scientific art, and contribute your thoughts for the benefit of all. Let us have a first-class meeting in 1891.

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SPRAY THE MOUTH.

Regulating appliances, at times, are held *in situ* for two or more weeks and in spite of the efforts at cleanliness, on the part of the wearer, bad odors may be emitted when the patient breathes through the mouth. After the mouth has been syringed with water, an ordinary spray apparatus with a long hard rubber tube, should be charged with cinnamon water, boracic water, silico-Fluoride water or other useful disinfectant and the mouth thoroughly sprayed. Let the patient do this at home if it is inconvenient to see him frequently. Sanitary measures of this sort are generally appreciated.

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PRACTICAL OR THEORETICAL.

Reading the journals from month to month as an editor must, who would keep *au courant* with progress in dentistry, we have been struck by the numerous republications of the so-called practical articles. Papers on filling with gold, amalgam (copper or other varieties), repairing rubber plates, bridge work, crowns, root filling and other items cover the major portion of articles republished. Essays on surgical procedures, on the causes of caries, teething, eruptive diseases or other strictly scientific subjects are seldom spread broadcast unless the author has a wide reputation. Viewing this state of facts,—for facts are stubborn things,—would it not be well

for writers for the dental press to take heed, and turn some of their energies in the direction of pure science? Nearly all of the "practical" articles may be found in their proper place in text-books and frequently it is painful to note whole chapters quoted from them in the padding of this sort of essays. What dental journalism needs at the present time is more original work, more experimentation, more study, and less palming off of text-book trash which has become obsolete and useless.

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DR. C. B. ATKINSON.

On page 724, current volume, appeared an abstract of a paper on "Medicated Oxyphosphate Fillings," by Dr. A. E. Baldwin. This abstract at the time was correct, but later Dr. Atkinson published his paper in full (see page 877) to which he added the following: "This practice I have now abandoned, as will appear later on." Of course, if this line had been in the original paper, the abstracter would have taken note of it, but as it was an afterthought, he is not responsible for the error.

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PROBES.

A very convenient, smooth-ended probe may be made from a worn-out Gates-Glidden drill. File off the end of the drill just at the beginning of the termination of the shank of the instrument, then grind it round and smooth of the proper size, and polish it. If the shank is spring-tempered, draw the temper, and it will be found quite as useful as a silver probe, with the added advantage of having a delicate handle, firm and large enough to be held easily by the hand. A probe should always be oiled or dipped in vaseline before being used.

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1891

With the present issue our labors for 1890 are completed. Throughout the year it has been our endeavor to place the newest, freshest and best dental thought before our readers. The reader is a better judge of our efforts in this direction than the editor; if we have failed to interest, instruct, or entertain, then the thousand or more pages of the DENTAL REVIEW for 1890 are worth little more than so much waste paper. The numerous letters of encouragement we have received during the year have been most gratifying, and if we can believe all that has been written, this journal has



filled no small place in the affection of the reading public. Our principles for the coming year may be summarized as follows: First. To give our cordial support to the World's Columbian Dental Congress. Second. To assist the dental colleges of the United States in requiring a higher standard of preliminary education before the entrance of students into college. Third. To uphold the colleges in maintaining a three term course of study. Fourth. To agitate the question of endowment of professorships in dental colleges, and other questions of public interest as they may arise.

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## DOMESTIC CORRESPONDENCE.

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### LETTER FROM NEW YORK.

NEW YORK, December, 1890.

*To the Editor of the Dental Review:*

DEAR SIR: Tammany politics have swept the floor, if not the streets of New York, at the November election. The Republicans are all going into the "lymp(h)" business preparatory to the campaign of '92. During the interim they purpose to fight the microbe, Free Trade, with Koch's theory. The atmosphere seems surcharged with excitement over Dr. Koch's discovery, but this is nothing to the effect caused by the impression that Dr. Younger has bought up all the mummies for their teeth, to carry on his revivification theory. This may be for the purpose of counteracting a slanderous report imported from Paris evidently with a motive to wipe out William [the] Younger. It is much regretted here that some of our better journals have allowed their pages to be smeared with such trash. No one of fair intelligence can fail to see at a glance that it is self-condemning. The author seems to have been experimenting with the "lymp(h)" treatment during his late visit to Berlin. No matter how much men may differ in opinions regarding Dr. Younger's vigorous efforts to prove the extreme benefits of the work he is engaged in. He has won too much the esteem and support of intelligent men to be laid aside by such foul dealing. The doctor's operations are before the profession and they will only stand upon their merit.

What the public needs to know of such subjects is the truth brewed from experience, and it is in a fair way to get it by such articles as are being published in the *New York Sunday Herald*

under the heading of, "What the Dentists say?"; one of which was upon "Implantation" which was elaborately illustrated. This article was by Dr. Ottolengui, which he has publicly acknowledged and given his reasons for writing. I will refer to this further on. It may not be generally known that the *Herald* is publishing articles weekly, "What the *Doctors* are saying," and have proved of general interest.

Soon articles began to appear, "What the *Dentists* are saying." You will notice that dentists are not *doctors* as usual. These articles are without signatures. Is not this in the line of progress?

The clinic of the First District Society was held the second Tuesday of November at White's depot: about eighty present. Several things of interest were presented. Dr. Watkins, of Montclair, New Jersey, demonstrated the use of his "Double-ended Glass Fillers," doubtless intended to change ends when one got tired. Dr. Hunter, of Norfolk, Virginia, introduced an "Obtunder" for sensitive dentine and the soft tissues, although the two efforts to prove its real efficiency on dentine, one of seven, and one of nine minutes' application, was reported did not give satisfaction to those in command. We do know from personal experience and observation that it does possess a power of benumbing that is decidedly manifest on soft tissue. I know of three operators who have been experimenting with this and it is agreed that it has value as an obtunder. On this basis we advise an intelligent trial of it; it seems to be in advance of anything we have had. We cannot expect the "Presto! Change!" in any of our medicaments. This is non-escharotic on soft tissue, if not prolonged in application.

Dr. E. Parmly Brown exhibited several improved articles, products of his fertile inventive genius. Dr. McLaren, of New York, an enterprising young dentist and inventor, presented a unique and useful furnace for porcelain work. Dr. Frost, of New Jersey, made a rapid contour operation with an improved mechanical mallet. A very interesting case was referred to Dr. Atkinson for diagnosis, which proved to be "Ranula." The doctor after obtunding the surface with carbolic acid for lancing, opened the large bulbous sac which resembled a fish bladder, containing a quantity of viscid discharge. After thoroughly washing out the cavity with peroxide of hydrogen, he placed a tent in the aperture, smeared with oil of clove and creosote to prevent its healing, advising its removal in twenty-four hours and dressing with pyoktanin, one of the won-

ders of the nineteenth century. The case is since reported to have yielded kindly and all is over. Dr. Atkinson is king in all these cases.

These clinics are always associated with profit to any who are wide-awake.

At the meeting of the society in the evening there was not the usual attendance. I speak of this because of the large attendance during the last few years. As I said in my last letter, the younger men are in power, yet they seem to be in earnest. The failure in attendance seems to be with the older members. It would seem that while there is so much in the air that needs sound and earnest attention, that there is a moral obligation resting upon these men of larger experience, to sustain these meetings by their faithful presence. The First District Society has earned a reputation worthy to be sustained.

Under the head of the code of ethics a case is being considered by parties in high repute. The committee who has it in charge reported it back to the society as not sustained without even calling for testimony from the person who made the charge. This made an exhibit of a good deal of friction. Lightning struck in two or more places at the same time, but order soon reigned after a large vote was given to send it back to the committee for a better adjustment. It was claimed that there was some misunderstanding.

Under this head (the code of ethics) not a little filibustering was indulged in by bringing charges against those supposed to have been indulging in newspaper puffs and articles, and particularly the article in the *New York Herald* on "Implantation," which I have referred to. This brought out Dr. Ottolengui, who acknowledged himself to be the author. The spirit of such articles, he claimed, were in line with the resolutions passed by several societies, commending the necessity and importance of educating the public by well-written articles through the daily press. The result of this discussion was a motion made by Dr. W. W. Walker to place this matter before the council and Dr. Ottolengui seconded it, emphasizing his second by saying he believed this to be decidedly in the line of progress. Judging from the many expressions heard, we query whether the time has not come to rid the code of ethics (so-called) of its irritating tendencies.

The essay of the evening was presented by Wendell Phillipps, M. D., subject, "Translumination of the Antrum, Larynx and Nasal



Cavities," with remarks on the treatment of Empyema of the Antrum. It was a scholarly production and presented in a very felicitous manner and demonstrated with the aid of improved electrical apparatus, making an enjoyable and not a little profitable occasion.

Discussions of a limited nature followed, principally of a complimentary kind, a good way dentists have of dealing with medical subjects which seem a little deep for men of short stature. Dr. Atkinson, who never quails in the presence of big men, handled the medical gentleman in one of his happiest moods, not failing to remind him of the latest and best remedy, "Pyoktanin." This brought out an adverse opinion from Dr. Phillipps. He had used the nasty stuff for vaginal douches and spoiled a whole chamber suite mattress entire. Dr. Atkinson did not lose the moment for a valuable hint, "Does such a careless use of a very valuable thing militate against its real value?" All of which the young doctor took in a happy way. The doctor, during his address, alluded to the "*Two Professions*." This produced a very comforting smile on the face of Dr. Kingsley, which caused him to crane his neck in a gyrating way to catch the general effect upon the audience.

Dr. Kingsley took occasion during the evening to introduce his already popular move for a banquet in honor of the patriarchs of dentistry. The society cordially constituted a committee to act with four others. His remarks were very elaborate in praise of one of these "old duffers" who sat by his side. It was a very pretty piece of oral gardening and seemed to be much enjoyed by the one he seemed to have in mind.

The Odontological Society held its monthly meeting the third Tuesday in November. There was not the accustomed attendance of former days. Several of the prominent members came in late and went away early. We noticed one face that we have never seen before at this society, that of Dr. S. A. Main. He is called the "millionaire" dentist, we think the only one in New York. He is the only one who supports a carriage and livery and this he does in fine New York style. He is a very genial and pleasant man to meet and can tell as good a story as any trout fisherman that we have ever traveled with. Dr. Main lives on Fifth Avenue opposite our snow-white headed Dr. Clowes which makes him look as handsome as the latest fad in gardening the big white chrysanthemum. We have a few other dentists that report says are rapidly

heaping up riches. Why should not a dentist become rich? Dr. Geo. Allan has introduced a new material for filling pulpless teeth called "celloidin" which he says is absolutely negative in its action: he believes it will prove a valuable adjunct to practice. He has not used it long enough to give a definite opinion. He advised experimenting with it. Resolutions eulogizing the many good qualities of the late Dr. Bronson were presented to the society, and voted to be placed in a Memorial page on the minute book of the society.

The essay of the evening was presented by D. Bryson Delavan M. D., Professor of Laryngology of the New York Polyclinic, subject "The Influence of Adenoid Hypertrophy at the vault of the Pharynx upon the Development of the Hard Palate." We give *the main points* of the paper which was illustrated by several drawings.

Adenoid Hypertrophy; Definition; Description.

A cause of nasal occlusion and consequent mouth-breathing.

Nasal respiration necessary to proper development of bony framework of face.

Nasal occlusion therefore followed by deformities of face, including superior maxillary bone.

Deformity of Hard Palate due to impaired development of nasal cavity and to atmospheric pressure.

It may occur at very early age. Impossible to cure when fully established. Best prevented or relieved by early recognition of the adenoid hypertrophy and its removal.

Description of removal. Results of removal of adenoid. Relief of nasal occlusion and rapid improvement of patient.

The speaker was interrupted by Dr. Kingsley, who asked an explanation of a portion of the anatomy represented in one of his drawings which we suspected, from a peculiar expression on the Doctor's face, he had a purpose in asking. We think the anatomy as represented was faulty. For some reason Dr. Kingsley took no part in the discussion, but his face was elevated at the usual angle. Sometimes he does more thinking than he does talking; possibly he may reflect himself in the "mirror." Although the emphasized points of Dr. Delavan's paper were given out to several previous to the meeting, yet there was a decided disinclination to take part in the discussion.

Dr. Niles, of Boston, opened the discussion, he claiming to have given considerable attention to the subject, and leaned in favor of the essayist that there was an influence exerted on the vault of the hard palate, saying he had several models which to him were proof. However, the general tenor of the discussion did not seem to confirm this view.

Dr. Dwinelle presented models which showed adenoid growths before treatment and after. He emphasized the importance of a well-trained finger which he held up for exhibition, which had had a large mission in his practice. He did not regard the dealing with these growths as a very serious matter. Dr. Jarvie added a few remarks; also Dr. Littig. After this there seemed to be even more of a hesitancy to take part in the discussion, which the appeal of the President could not overcome. He then turned to the essayist asking him to close the discussion. At this juncture Dr. Atkinson inquired if it was the purpose of the President that no more was to be said.

He replied that he had desired, and so expressed it, that all in the room should take part, and said: "We would like to hear from you, doctor." Dr. Atkinson replied: "I do not know that you will when you hear what I have to say!" He said he was all in a tremor because of the position those present had allowed themselves to be placed in. He said that he felt mad at the dentists who knew so much should seem so unwilling to assert their knowledge. He was too proud of the dentists for whom he had labored so earnestly to withhold themselves in the presence of medical men. "For," says he, "We do know a great many things that medical men need to know, and they also know some things that we need to know. So let us be free in our interchange of thought, one with the other." He had met in his practice what the essayist had directed their attention to, adenoid growths. He had delineated both in societies and at his office many times the dealing he had had with a very interesting case where these growths were occasioned by a large air-chamber in a continuous gum set of teeth extending back in the soft tissue, involving the uvula, and even to the œsophagus, the effect of which had lowered the tone of the patient to a serious extent. He says: "I want to reply right here to the statement which has been made that the removal of these growths necessarily involves the loss of much blood. I say it is entirely unnecessary.

This case to which I refer was treated to a successful issue without the loss of a single drop of blood. The local dressings consisted only of a saturated solution of salicylic acid in 95 per cent alcohol, applied in alternations as the case seemed to require from time to time. At each dressing it was only necessary to thoroughly cook the squamous layer of the epithelial covering which is of an



albuminous nature, resembling after the application, the cooked white of an egg. This is shed, and following the new growth appears, allowing Nature to assert its legitimate sway in the curative process. This I hold is the only intelligent course to pursue, for I assert that the removal of these growths by the knife, or deep-seated operations by snares, and otherwise have a tendency to produce an adverse tissue which is scar tissue, rather than by Nature's own methods." We know by the testimony often repeated by Dr. Atkinson, that he has great cause for intense feeling upon this subject because of the terrible treatment of these growths which was visited upon his blind brother. Many will remember that he has often said that this was what so disgusted him with medicine that he was forced to take up dentistry as a practice, hoping to produce something better in the interests of humanity. Dr. Atkinson said in continuing his remarks that he considered that the successful treatment that he had demonstrated, was one of the grandest achievements of his practice. He did feel in earnest that the dentists should get a grip of its value and show to the world that they held no second place in the healing art. Dr. Ottolengui added his testimony to the wonderful efficacy of the virtue of the treatment of the case which Dr. Atkinson had delineated. He was grateful that it was his good fortune to have witnessed the successful issue of the case. He said he thought it was a remarkable case, and the results of the treatment also.

The President made some desultory remarks, calling attention to the fact that an able paper was read before the anniversary meeting of the First District Society, by Dr. Talbot, of Chicago, which attracted more than ordinary attention, which discussed the relation of mouth breathing to high vault arches. For this reason it would seem that Dr. Delavan's paper ought to elicit more interest.

The editorial in the November number of the *International*, is particularly encouraging, inasmuch as it accords one great man to New York. It is considered quite marvelous how rapidly noted men can be grown in shallow soil.

A good story was told to-day in our office of the result of a transplanted tooth by one of Chicago's brilliant operators. The tooth after being treated according to such methods was sent out with the patient on its good behavior. A political meeting was attended the same evening in which "hollering" and hooting was

indulged in. Next morning the tooth was missing ; that's the last seen of it.

The meeting of the Brooklyn Dental Society was held Monday evening, Nov. 24, at Wilson's café. Twenty-eight sat down to dinner. After moderately discussing the reasonable and wholesome repast, a half hour was spent in chit-chat, the meeting was called to order at 8:30 p. m. with an addition of about fifteen more who came in after dinner. We met among the number Dr. Keys, of Rio Janerio, a bright and promising dentist, a native of Alabama. He was on his wedding tour to this country for a visit to his friends; will spend some three months here before he returns. He is an associate with his brother-in-law and cousin, Dom Pedro and his Court being formerly their patients. We also noticed the genial Dr. O. E. Hill present, who is never happier than when making things lively for the boys. It seems that he was on a committee and asked for instructions. He said a former committee had reported and had been "sat down on," and he did not care to take the same risk; but have no fears, the good-natured Doctor never fails to put through what he undertakes. Dr. Reh fuss, of Philadelphia, was essayist for the evening, and gave a very bright and elaborate paper upon the use of massage treatment in connection with dental pathology. It was an earnest presentation of the subject, showing a diligence of attention and an observation of its practical bearing in our practice. The attention which he received, as manifested by his audience, could only be construed as a decided compliment to the merits of his paper.

This proves when a man has something worthy of attention that he will find ready listeners. In order to emphasize the practical part of his paper, he was aided by drawings, which showed the fingers in the act of manipulation. He remarked that while he had presented this subject previously to the profession, and had received some very complimentary notices, which he did not fail to recognize and fully appreciate, yet his principal ambition was to emphasize the importance of its adoption, that the value of our practice might be enhanced. Certainly no intelligent practitioner could fail to see by the delineation of cases of his own in practice, that it possessed a value worthy of our earnest attention. Drs. Hill and Brockway spoke of the paper in complimentary terms.

Dr. Atkinson, in response to the President's invitation, accorded the essayist his admiration for his earnest and brilliant efforts. He

said, while there was much in the subject which, if it received our intelligent notice, could be made an adjunct of value in the alleviation of the many discomforts coming under our notice, yet, it was not the all-in-all. He said he did wish to emphasize what he had said, as an encouragement to such an earnest presentation. He had himself long regarded certain manipulations of disordered parts as remedial. The essayist has given us an intelligent system which involves a careful study in order to make it of practical value. Dr. Atkinson referred to the presentation of a similar treatment by Dr. Waters, of Boston, with which he associated a novel kind of friction belt, constructed of manilla and hair, and claimed to be charged with electrical and magnetic power.

Dr. Atkinson referred to his personal experience in the baths where it was assumed that the bathers were scientifically trained, but had only found two that had any grip for understanding the applications of the principles involved in the massage treatment. Most of these bathers would only violate the practice and produce adverse conditions. He said there was so much embraced in the being able to do good rather than mischief, that consecutive teachings can only point the way of truth.

Dr. Atkinson closed his remarks with a little fatherly exhortation to improve the opportunity of informing themselves in histological and embryological studies so that they might readily take a more ready grip upon such subjects as had been presented to them by the essayist which only a knowledge of basal principles could make them masters of the situation. As Prof. Heitzman has just returned from his former home in Germany, and the season has arrived for the forming of his classes, my advice is that you form a class among this body at once and receive the benefits which must accrue from such an able teacher. The demands of the times are such that no one who is without the latest and best can expect to measure up to the requirements of advanced practice. Dr. Will Johnson, who exhibits an earnest intention for the growth and prosperity of the Brooklyn Society, introduced a resolution that some one member be appointed at each meeting to present a synopsis of the best things which he had seen or read during the month, which was adopted. We inquired the cause of the absence of some of the earlier members; we were told they were inclined to retire, as they had become somewhat tired of so many meetings. This suggested a query, "Can a man in active practice afford to retire from



participation in the conferences of his fellows?" It was announced at this meeting that the banquet committee will be able to give the date for the occasion sometime during the latter part of January. It will doubtless be one of the most notable events the dentists have ever had, and one which will generate a good healthy spirit, aided by the recalling of many pleasant reminiscences. Just what qualifies one to be considered a patriarch has not been revealed. Possibly fifty years or more of practice. "What the dentists are saying," in the *New York Herald*, is producing a good deal of interest and not a little criticism. It is quite evident that most of the articles are by one writer. He lacks in giving a popular terminology, for instance; pericementum is said to be a membrane about the root of the tooth, and then follows closely the term pericementitis without any explanation. There is much need of simplicity in expression in this direction.

They are on the whole the best efforts ever made of the kind, and it is commendable in the *Herald* for initiating such a movement. Reading articles have been written before for the daily press, and have been paid for with a purpose for calling in patients, which proved that the people did read and give attention to their teachings.

While this was for individual aggrandizement these articles in the *Herald* will be helpful to the general practitioner for the more intelligent the public becomes, the more demand will come for intelligent service. From what I learn I do not think these articles will be confined to one or two very long. It will be quite wise that those who are announcing themselves to the public should be able to sustain all that they have put forth, or they will fail under the criticisms which are likely to follow.—Ex.

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#### THE TENTH INTERNATIONAL MEDICAL CONGRESS.—A VISIT TO THE BRITISH DENTAL ASSOCIATION.

BY W. C. BARRETT, M. D., D. D. S., BUFFALO, N. Y.

(Continued from page 911.)

I left Paris one bright morning for Dieppe, and the evening found me at the Victoria Hotel, Trafalgar Square, London. The next morning I had but time to drive to Ash & Sons, Broad Street, Golden Square, for my letters, and thence direct to Victoria Station, where I took train for Exeter and the meeting of the British Dental

Association. In the last number of this journal, I gave a brief account of some of the circumstances attending the early years of this Association.

The organization of dentistry into something like a profession in England, was not attended by the difficulties which beset the pioneers of a reputable practice in America. The country is comparatively small, and is homogeneous. In America we have nearly half-a-hundred separate States, each with its own distinct autonomy, each supreme in its local government, and each legislating too often at cross-purposes with the other States. There is no general law which can prescribe what shall be the necessary qualification for legal practice in the country as a whole, but each State sets up its own standard, so that a man qualified to practice in one locality may be totally disqualified for another. In Great Britain, all that was necessary was to secure a general law from Parliament, and that answered for the realm.

This law, which has been in force about ten years, provides for a general registration of all dentists, and this registry is under the control of the General Medical Council. The qualifying dental degree is that of L. D. S.—Licentiate of Dental Surgery—and this degree may be conferred by the schools or by certain examining boards. The British Dental Association is the representative head of dentistry in Great Britain, and its annual meeting is the great professional event of the year. There are Scottish and Irish branches, and England itself has a Southern, a Central, a Western, an Eastern and a Midland Counties' branch, each with its annual meeting, and thus dentistry is very well organized in Great Britain.

The British Dental Association is not exclusively a scientific body. In fact the reading and discussion of professional papers is not necessarily the principal business to employ the time at its annual meetings. It must promote the general welfare of dentists, look carefully to the enforcement of the law, sustain the general ethical tone, and pass such inter-professional legislative acts as will serve the best interests of the whole. One of its most important duties is to maintain the social status of its members, and to raise the general body in the estimation of a people who judge men largely by an arbitrary standard of gentility. The association stimulates the social virtues, and much of its time is devoted to promoting a feeling of good fellowship. As a consequence, its din-

ners, its luncheons, its receptions, its balls and its general entertainments, are, in character and number, quite unknown to like societies in this country. At the Exeter meeting, for instance, there was a general *table 'd hote* lunch at the headquarters hotel each day, and a formal dinner at six o'clock, at which all members were expected to be present so far as was practicable. These meals were very elaborate, and the company was exclusively professional.

There was also another thing to which American societies are a stranger, and that was a "Smoking Room." This was a large hall in the principal hotel, sufficient to accommodate all the members, and provided with tables, chairs and sofas, writing materials, a piano, blackboard, etc., and this was also exclusively for the use of members. The average Englishman does not arise from his meals and go directly to his business. Especially after dinner does he love to sit and enjoy his bottle of wine, or his glass of grog, ginger ale or "lemon squash," and smokes his pipe or his cigar. So the smoking room becomes the general assembly place, for in an English hotel you never see a crowd of men in the lobbies and halls, or lounging about in the doorways puffing cigars. Of course there are no "bar rooms," in the American sense of the term. The guest goes to the smoking room for his after-dinner pipe and drink.

The Exeter meeting smoking room was something which might with benefit be copied in America. The hours spent there were hours of sociability, of conviviality even. In addition to many capital vocalists and elocutionists among the members, some professionals were engaged, and there were frequent songs and recitations, largely of a comic character. When the assembled company had made up its mind that it wished to hear some one and began calling for him, his best way was to yield gracefully, for there would be no peace for him until he did. He might respond by a song, an instrumental selection, a recitation or a brief speech; it was quite in order for him to tell a story, and one member gave entire satisfaction by whistling; but he must in some way contribute to the general entertainment if called upon. The intervals were filled up with conversation and every man had a glass of something at his elbow. It might be milk and water, and he was under no obligation to drink even that, but he must give an order to the waiter. On my first entrance I was asked what I would drink, but as I was not accustomed to anything *after* dinner, I attempted to crawfish.



"But you must have *something*, you know," was urged upon me with that peculiar English-rising inflection, which it was impossible to resist and—I had it. Then followed the most enjoyable hour which I ever spent at a society meeting, as I was alternately amused and thrilled by the successive contributions, and instructed and entertained in conversation between *whiles*.

I have spoken of this official smoking room at length because it is something of which we do not possess any counterpart. While I am about it I might as well give some account of the other social entertainments.

The old city of Exeter seemed profoundly impressed with the importance of this meeting and the high standing and worth of its guests. Everything was given up to them. The meetings were held in the Albert Memorial Museum, which seemed to be closed to all other visitors for the occasion, while the Guild Hall, Rougemont Castle, Victoria Hall, The Northernhay, Exeter and County Club, Devon and Exeter Club, Constitutional Club, Athenæum, Exeter Cathedral, and seemingly every other public and private place were opened for the entertainment of the members.

On the first evening a grand reception was given by the Right Worshipful, the Mayor of Exeter, to welcome the members to the city. The mayor of an English city, especially one of as great antiquity as Exeter, is a most imposing personage. His gold chain of office, which looks as if it might weigh some pounds, and his official robes, would distract attention from an American drum major. He is always a dignified gentleman, and to be officially received by him is no light or passing honor. The evening was spent in listening to the music and in conversation. The company assembled was a large one, all appearing in full dress, while the orders and decorations, some titled and distinguished visitors and the plumage of the ladies made the scene especially brilliant.

On the evening of the second day there was a *soiree* given by the Reception Committee, at which there was music by the band of the Royal Marines, a microscopical exhibition, another of electrical apparatus, and yet another of photo-micrographs the whole followed by a grand ball.

On the third day tickets were provided for a horticultural exhibition in the Northernhay (the English are very fond of plants and flowers, and such exhibitions are exceedingly popular), while in the evening came the grand annual dinner. This was the culmination

of the social part of the meeting, and for the benefit of such of the readers of this journal as have never attended a formal English dinner, I must give a brief account of it. I need say nothing of the *menu*, which was elaborate, but not overwhelmingly so. The literary part was more remarkable. The English dine much more formally than we do, and at an anniversary dinner the speeches are formidable. As a rule English speakers are more noted for their directness and force than for any special graces of oratory. Then it often takes from three to seven men properly to launch and safely to house a toast. The chairman first, in a few remarks, calls upon some gentleman formally to propose the toast, and this is done in a speech of greater or less length—usually the former. Then he calls upon another gentleman formally to second it, after which from one to three gentlemen are asked to respond in formal speeches.

There were a number of lords and baronets and gentlemen of high degree present at the dinner, and each was called upon either to propose or to make response to some toast. Some were good speeches, more were indifferent, while a few were decidedly bad. To the credit of the intelligence of the dentists of England, let me say that far and away the best speeches of the evening were by dentists. I will append the programme of toasts, that it may be seen how formidable it was. Of course the first one was "The Queen and the Royal Family." Probably the most of the company would have left the room if this had been omitted, for it would have been considered a mark of decided disloyalty. I do not think I was ever at a public meeting in England of any kind, not excepting church prayer-meetings, when the exercises were not opened with the name of the Queen. Some years since I heard a man *commence* an expression of disapproval of the Queen in a concert hall in London. He did not finish it, for he did not get a chance. This has nothing to do with the personality of Victoria, but is the respect demanded for the head of the monarchy. But here follows the list of toasts at the annual dinner :

## TOASTS.

- "The Queen," ..... Proposed by the Chairman  
 Glee—"God Save the Queen."  
 "The Prince and Princess of Wales and rest of Royal Family," .....  
 ..... Proposed by the Chairman  
 Glee—"God Bless the Prince of Wales,"—*Richards*.  
 "The Navy, Army and Reserve Forces," ..... Proposed by the Chairman and re-  
 sponded to by Admiral White, C. B., Col. Milne-Home, Sir John Shelley, Bart.  
 Glee—"Soldier's Love,"—*Kucken*.

- "The British Dental Association." .....  
 ....Proposed by Lord Sidmouth and responded to by J. Smith Turner, Esq.  
 Glee—"Fill the Shining Goblet,"—*Parry*.
- "The Medical Profession." .....Proposed by  
 Morton Smale, Esq., and responded to by Dr. Slade King and Dr. Woodman  
 Glee—"The Complaint,"—*Graner*.
- "The Press." .....Proposed by W. A.  
 Hunt, Esq., and responded to by S. H. Glanville, Esq., and A. Underwood, Esq.  
 Glee—"Foresters Sound the Cheerful Horn,"—*Bishop*.
- "The City and Corporation of Exeter." .....  
 ....Proposed by F. Canton, Esq., and responded to by The Ex-Mayor  
 Glee—"The Three Chafers,"—*Truhn*.
- "The Dental Benevolence Fund." .....Proposed  
 by A. H. A. Hamilton, Esq., and responded to by G. W. Parkinson, Esq.  
 At this point the contribution boxes were passed from hand to hand for the  
 benefit of the benevolent fund.  
 Glee—"When Evening's Twilight,"—*Hatton*.
- "The Visitors." .....  
 ....Proposed by S. Lee Rymer, Esq., and responded to by Lord Poltimore  
 Glee—"Lovely Night,"—*Chevatal*.
- "The Chairman." .....Pro-  
 posed by Felix Weiss, Esq., and responded to by J. T. Browne-Mason, Esq.  
 Glee—"Mynheer Vandunck,"—*Bishop*.  
 "Good Night,"—*Ferris Tozer*.

On the last day of the meeting the members were specially invited to an inspection of the celebrated Exeter Cathedral, and of the Guildhall, and Rougemont Castle was placed at their disposal. In the evening the President with his lady gave an "At Home," with organ recital and vocal music, at Victoria Hall, and this ended the round of entertainments. I had subsequently the personal pleasure of joining a small party for a carriage drive of some days through the picturesque parts of Devon and Cornwall. This was one of Dr. Cunningham's "personally misconducted tours," and it was one of the most enjoyable which I ever took. It was a rather polyglot party of six members, comprising representatives from England, Scotland, Germany, France, and America, but it was an especially jolly one. We drove for more than a hundred miles along England's rock-bound coast, visiting such places of wonderful beauty as Barnstable, Bideford, Clovelly, Westward Ho, Appledore, Morthoe, Ilfracombe, Lynton, Lynmouth, Porlock and Minehead, finally separating at Taunton, where the leader of the party and myself bade adieu to the rest and turned our faces toward London. We had rode over all the ground, made famous by Blackmore in his "Lorna Doone," and by Kingsley in his English novels. We had become intimately acquainted with the beauties of Devon—the "Garden of England," had feasted almost to satiety on "clouted cream" and Devonshire "junket." There had been



ample opportunity to see the British Dentist in his hours of relaxation as well as when engaged in the discussion of intricate scientific— But stay! I have become so much absorbed in this attempt to describe the social side of a British Dental Association meeting that I have not said one word concerning the papers and discussions, and must leave their consideration for yet another chapter in this already too long drawn out article.

(TO BE CONTINUED.)

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## REVIEWS AND ABSTRACTS.

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DESCRIPTIVE ANATOMY OF THE HUMAN TEETH. By G. V. Black, M. D., D. D. S. Published by the Wilmington Dental Manufacturing Co., 1413 Filbert Street, Philadelphia, Pa., 1890. Cloth, \$2.50.

This is the first book devoted exclusively to the gross anatomy of the human teeth. It describes the external configuration and surface markings peculiar to the typical tooth of each denomination, together with two or three normal variations. It is an effort to systematize the nomenclature of dental anatomy; some of the names supplied are new and some are already in use.

In looking at this book it will surprise many that its like has never been before produced. The only work which approximates it is Dr. Judd's pamphlet, published by the Illinois State Dental Society early in the "seventies." That, however, had only a limited circulation. Of personal knowledge, it has been the author's desire to see such a book in the hands of college students, and in the libraries of practitioners for several years past. Perhaps it was the well-known fact that Dr. Black was so admirably fitted to deal with this subject himself, that deterred others to whom he suggested the writing of such a book, from undertaking the task.

Force of circumstances as well as intrinsic merit will go to make this book a part of permanent dental literature, for it has the advantage of being the first "dental anatomy" deserving the name. It is a question which is the author's greater service—giving the profession the knowledge it contains, or producing the first book exclusively devoted to the subject. Unquestionably future editions can show much improvement over this one, which is saying

of it nothing derogatory, but the really valuable service to the profession is that we have in it a beginning.

The volume contains 153 pages, and 136 well-executed cuts. The text and illustrations are in inseparable relation, each being dependent upon the other. It is as futile to attempt to understand the text without the cuts, as it is to understand the cuts without the text. It lacks a table of contents, but at the end of the book is an alphabetical index, which, however, would be more useful if more complete. That this feature is inadequate to a reference book is seen by the omission or but partial mentioning of many terms used throughout the volume. Take for instance, "angles," "cusps," "lobes," "sulcus," etc.

Following a pointed preface, the first paragraph enters immediately into the purpose of the author. Characteristics common to all the teeth are first discussed and the adopted plan of terminology explained.

It must be confessed that the teaching efficiency of the book is greatly impaired because the terms employed to describe parts and surface markings are not printed in conspicuous type. Some italics are advantageously used, but this idea should be carried out in capitals. Classifications in columns and short paragraphs, would be another great aid in this direction. Then, too, conciseness is as dear to the student's heart as emphasis. This should forbid the multiplication of names for a single part. One term and definition and one only, is permissible. Synonyms and other definitions might be added in foot notes and leave the text more direct and the style more terse.

On pages 14, 15, 16, 17, 18 and 19, tables of measurements of the different teeth, permanent and deciduous, are given in millimeters and tenths of millimeters, and in inches and hundredths of inches, showing "length over all," "length of crown," "length of root," "mesio-distal diameter of crown," "labio- or bucco-lingual diameter," and "curvature of the gingival line." The figures are given for the average, greatest and smallest sizes of teeth of each denomination. The preparation of these tables must have cost much patient toil, for Dr. Black's investigations, as is well known, are invariably made with the utmost, painstaking nicety and scientific accuracy.

The explanation proper of the different teeth extends to page 130. In order to give an idea of its excellent character, it will suffice to

quote a portion of paragraph 43, describing the upper first bicuspid. "The occluding surface has two prominent cusps—the buccal (*a*) and lingual (*b*)—and is traversed from mesial to distal by a deep sulcus. The buccal cusp is the larger and forms the terminal point of the buccal surface. From the point of this cusp four ridges lead away at right angles. Two of these form cutting edges, which slope away mesially and distally to the mesial (*h*) and distal angles (*g*), when they join the marginal ridges, etc., etc." With such minuteness of detail, the description is carried out for each permanent and temporary tooth. In the consideration of the pulp chambers and canals, a unique and entirely original method of illustration is employed which has the merit of being available to any one. It is to grind (or saw) the natural tooth until the part to be represented is exposed, when prints can be made from it at once by inking it on an ordinary inked pad made for rubber stamps. The outlines of the tooth and canals are perfectly shown. No one who sees the book can doubt its utility to the student, and the exact knowledge it gives the practitioner who already has years of successful work behind him, adds an interest to the daily routine, amounting almost to a fascination. With the exception of a few typographical blunders, the Wilmington Dental Mfg. Co. has made a very creditable book.

THE MICRO-ORGANISMS OF THE HUMAN MOUTH. The Local and General Diseases which are caused by them. By Willoughby D. Miller, D. D. S., M. D., Professor in the University of Berlin.

With one hundred and twenty-eight illustrations. one chromolithographic and two photo-micrographic plates, Philadelphia, The S. S. White Dental Manufacturing Co. Price, cloth, \$5.

In his preface the author says, "It has been established beyond all question that myriads of micro-organisms are constantly present in the human mouth, and that these, under favorable circumstances, are capable of manifesting an action of the utmost significance upon the local as well as the general health of the patient. Not alone are they responsible for the vast majority of those diseases of the teeth and contiguous parts which the dental surgeon is called upon to treat, but they also give rise to other local and general disorders of the most serious nature.

"These various disturbances are produced partly by the direct action of micro-organisms and their products upon the teeth and



the mucous membrane of the mouth, partly by constant swallowing of large masses of bacteria, partly by carrying them into the lungs, particularly in cases of violent inspirations, and finally by their obtaining an entrance into the blood or lymph vessels in the various ways described in Chapter XI.

"The existence of a most excellent nursery for bacteria at the very portal of the human body is a fact which has only recently begun to receive the attention which its importance demands.

"The contents of the book consists chiefly of original investigations which, in part, have appeared in different American, English and German journals, and in part appear here for the first time.

"The first three chapters are designed more particularly for such readers as may not have occupied themselves with bacteriological studies, it being, in my opinion, utterly impossible for any one to obtain a proper understanding of the action of micro-organisms in the mouth without a knowledge of at least the elementary principles lying at the foundation of the science of bacteriology."

It would occupy too much space to reproduce the table of contents entire, but the headings of the chapters will serve to give a general idea of what the author has undertaken. Chapter first has a short outline of the morphology and biology of bacteria, and some account of their action upon the living vegetable or animal body, and lastly their action upon lifeless matter.

Chapter second relates to the nutrient media for bacteria in the oral cavity. Chapter third is a developement of the study of micro-organisms in the oral cavity. Chapter fourth contains results of biological studies on the bacteria of the mouth, and Chapter fifth treats of mouth bacteria as exciters of fermentation.

Chapter sixth, though entitled "Action of the products of fermentation on the different structures of the mouth," is really a brief statement of most of the theories heretofore proposed to account for caries of the teeth.

Chapter seventh gives an account of the author's original investigations on the decay of the teeth, in which, after introductory remarks on the histology and chemical composition of the hard dental tissues, he describes the physical phenomena of decay, in detail for enamel, dentine, cement and enamel cuticle, the transparency and pigmentation of the tissues in decay, the chemical changes attending decay.

The microscopical phenomena of decay, with equal detail for the different tissues composing the hard parts of the teeth, with directions for preparation of specimens, staining, etc., lastly something about decay of teeth worn on plates, artificial decay, caries of animal teeth, and spontaneous healing of dental decay. This chapter is profusely and beautifully illustrated with engravings and photographs of specimens of decayed dentine, etc.

This and the two succeeding chapters on the etiology and the prophylaxis of dental decay, respectively, will prove very interesting reading to such of the dental profession (if there be any) who have not read the various articles on these subjects which Dr. Miller has heretofore published in the dental journals, and the orderly and consecutive presentation, following the necessary preliminary chapters will enable ordinary readers to understand the subject more easily, and so to become more interested in it than many have been able to do in the more fragmentary presentations heretofore given to the public.

That the investigations and experiments here recorded establish the main points in the etiology of dental caries upon a scientific basis, few will be found much longer to deny, and the service rendered to the cause of scientific pathology, and to the dental profession, entitles Dr. Miller to our everlasting gratitude.

From chapter ninth, on the prophylaxis of dental decay, we may quote a paragraph or two, "To every one at all acquainted with the nature of that condition of the teeth denominated as decay, caries, etc., and with the causes by which it is produced it must be apparent that there are four ways by which we may counteract or limit the ravages of this disease. We may endeavor (1) by hygienic measures to secure the best possible development of the teeth; (2) by repeated, thorough, systematic cleansing of the cavity and the teeth, to so far reduce the amount of fermentable substances as to materially diminish the production of acid, as well as to rob the bacteria of the organic matter necessary to their rapid development; (3) by prohibiting or limiting the consumption of such foods or luxuries which readily undergo acid fermentation, to remove the chief source of the ferment products injurious to the teeth; (4) by the proper and intelligent use of antiseptics to destroy the bacteria, or at least to limit their number and activity." "When at the beginning of the present decade, through the most exact methods of bacteriological investigation now in use, the true (parasitic) cause of

one disease after another was brought to light, we had many reasons to hope that the helpless position of medicine in the presence of the severest infectious diseases was soon to be changed. As yet, however, our expectations have not been realized. With the exception of the still somewhat doubtful triumphs of Pasteur over anthrax and hydrophobia, very little advantage whatever has resulted to therapeutics from the eminent bacteriological discoveries of the last ten years. Consumption, cholera, typhus, diphtheria, syphilis, have not become less terrible through the discovery of the specific micro-organisms of these disorders."

"Diseases which came under the treatment of the dentist form no exception to this statement. The fact that decay of the teeth is of parasitic origin having been once established, the thought suggests itself that we ought to be able by means of properly chosen antiseptic materials not only to arrest decay, but to prevent its appearance. This is, indeed, the avowed object of the very many antiseptic mouth washes now in the market. As a matter of fact there is no evidence that anything whatever has as yet been accomplished in the prophylactic treatment of the teeth through the use of antiseptic mouth washes, and it is evident that any one who would discover some means by which the often fatal ravages caused by decay of the teeth might be held in check would thereby confer a great boon on humanity."

The chapter proceeds with a discussion of the numerous materials and combinations that have been proposed as antiseptics appropriate for use in the mouth, with various tables of relative antiseptic values as ascertained experimentally, and the suggestion of several combinations likely to be more or less effective for the purpose of sterilizing the mouth, lastly an account of numerous experiments to ascertain the antiseptic value of certain filling materials, the results of which indicate that copper amalgam has the power to sterilize decayed dentine in the floor of a cavity beneath it, and powdered sulphate of copper sprinkled on the floor of the cavity or incorporated with phosphate cement or gutta-percha is equally efficient, but both of these darken the teeth. Oxy-chloride of zinc showed a very marked, though not complete, antiseptic effect, while iodoform powder, phosphate of zinc and gold amalgam were all of them inert.

Experiments as to the action of tobacco upon the teeth, and directions for sterilizing teeth for implantation complete this interesting chapter.



Part second of the book, treats of the pathogenic mouth bacteria and the diseases which they produce. Chapter ten, beginning with the buccal secretions as carriers of toxic substances and of parasitic excitants of diseases, followed by an account of various disease-producing bacteria in details.

Chapter eleven, of the entrance portals of these poisonous organisms. 1. Following mechanical injuries. 2. Gangrenous tooth-pulps as centers of infection. 3. Complaints caused by direct action upon mucous membrane of mouth and pharynx. 4. Pulmonary diseases caused by the inspiration of germs from the mouth. 5. Complaints of the digestive tract caused by mouth bacteria. 6. Points of attack furnished by a lack of resistance in the soft tissues of the mouth. Under this head are some original investigations concerning *pyorrhœa alveolaris*, and something concerning a number of special infectious diseases.

Chapter twelve contains supplementary remarks on bud, mould and animal fungi.

An index of authors whose works are referred to or quoted, contains more than three hundred names, and a list of works and magazine articles fills nearly eight pages. One must read the book, however, to realize the vast amount of work represented in its pages, and whether all the observations and resulting conclusions shall stand the test of time and the critical review of other laborers in the same fields or not, there can be no doubt that the author has made important additions to our knowledge of many of the subjects treated of.

There may be danger that the majority of the dental profession are inclined to think that works of this class are theoretical rather than practical. The observations of twenty years have convinced this reviewer that such opinions are erroneous mistakes. It is hardly possible for any man to read this book carefully without finding his daily routine of practice, sooner or later, benefited by it in a marked degree.

A TREATISE ON THE IRREGULARITIES OF THE TEETH AND THEIR CORRECTION, INCLUDING, WITH THE AUTHOR'S PRACTICE, OTHER CURRENT METHODS. By JOHN NUTTING FARRAR, M. D., D. D. S. In Three Volumes. Volume I. H. Helfield. Gen'l Agent, N. Y.

It is but within a few years that orthodontia, or the study of irregularities and abnormalities of the human dentition, has grown

into what may be called a science by itself. For a long time the inclined plane, the screw, ligatures and various forms of wedges, were employed to move teeth, but the systematic study of the causes of aberration and the adaptation of appliances in conformity with established laws, is but of recent date. Monographs have been written upon certain phases of irregularity, and ingenious men have employed effective devices, but none of these have covered the entire field and deduced a complete system.

One of the most prolific of the occasional writers in this branch of dental science, was Dr. J. N. Farrar, of New York, who has for many years been engaged in the special study of the subject. His observations and experiences taught him that operations for the correction of abnormalities in position should only be entered upon after a careful determination of the etiology of the particular case. He urged that, as in nature all growth and development was through alternating periods of activity and rest, the force to be applied in producing modification of development should be in conformity with this law. Reasoning upon and experimenting in this line of practice, he developed what he denominated the positive method of regulation; that is, the application of a rigid force which should be unyielding up to a certain point, but which should then cease to act and allow a period of comparative rest to the tissues. He discarded all elastic and continuously acting devices and placed his sole dependence upon those which were positive and definite in their action, and thus brought his methods into conformity with an established natural law and reduced to a comprehensive system that which before had been a desultory and empirical practice.

Dr. Farrar's years of observation, his earnest and unflagging study, his wide and varied experience and his acknowledged ingenuity and fertility of invention, have finally resulted in the production of the great work now under notice. It has been a labor of love, for in the present condition of dental practice and with the comparatively few reading men who are engaged in it, he cannot hope to receive back the many thousands of dollars which the three volumes of seven or eight hundred pages each, with the two thousand illustrations and the many years of constant experiments, study and labor, will have cost. But the author will have builded for himself a monument more enduring than one of marble, and which shall tell to remotest dental ages the story of his labors.

It is impossible within the limits of such an article as this to offer a complete review of this comprehensive and voluminous work, and familiar though the writer of this notice has been with its constant progress, he scarce feels himself competent critically to compare the various methods and study the mechanical laws which should apply to each. Nor is this necessary. The natural and acquired qualifications of the author for his task and the time which he has devoted to it, are sufficient warrant. It is some years since the work was supposed to be nearly ready for issue. But before the final proofs could be corrected some new discovery or observation would teach that, in one particular branch or another, the views presented demanded modification, or that the uttermost boundaries of his subject had not been reached, and the chapter would be rewritten, new illustrations added and the whole made perfect at the expense of much time and money. This was repeated again and again, as long as it was thought that improvements could be made.

If space permitted the publication of the table of contents, a fair idea of the full scope of the work could be given. A brief epitome of the subjects comprised in the first volume must suffice. The several parts are as follows: Preface; Preliminary Chapters; History; Etiology; Philosophy of the Author's system; Nomenclature; Explanation of the Principles in the construction of regulating apparatus; Retaining devices; Laboratory rules for the making of regulating devices; Philosophy of the application of force; Eruption of Teeth; Antagonism of Teeth; Correction by grinding; Extraction for the prevention and correction of Irregularities.

These fourteen parts are divided into seventy chapters, in which all the various subdivisions of each subject are considered and illustrated by numerous engravings, the most of which are from the author's own drawings. The work is thoroughly original and entirely characteristic in its every chapter. While chiefly devoted to an exposition of the views and methods of Dr. Farrar—as it ought to be—it yet gives a careful resumé of that which has been accomplished by others, and in this it bears the evidence of a desire to be strictly just, and even generous in awarding credit to fellow-workers in the same field.

There is little doubt that carping critics will find pegs upon which to hang adverse opinions, but there is also little doubt that the dentists of the world will accord to Dr. Farrar the credit of



producing the most comprehensive and carefully digested work which has yet been written upon any special field of dental practice. Henceforth no dentist who pretends to any knowledge of the literature of his specialty can remain in ignorance of this treatise. Nor can any one who claims any proficiency in, or desires to inform himself upon the subject of Orthodontia, afford to be without this work in his library, for it is an encyclopedia of its subjects.

W. C. B.

THE DENTAL LABORATORY, a manual of gold and silver plate work for dental substitutes, crowns, etc., regulating appliances for irregular teeth, repairing, etc., to which is added manipulations in vulcanite and celluloid, laboratory hints, suggestions, fixtures, etc. By Theodore F. Chupein, D. D. S. Published by Johnson & Lund, 620 Race St., Philadelphia. 1890.

The comprehensive title shows very truthfully what this book is. The story of mechanical dentistry is told so simply and directly that one is at once reminded of the persuasive and deluding text-books which are advertised to teach a foreign language in thirty lessons. Perhaps the most useful function of this manual is its way of explaining how many laboratory conveniences can be easily made. The descriptions are made so clear by plenty of illustrations, that a student seriously interested in his profession would not rest without having worked out all the suggestions. From the erection of the bench to the manufacture of a foot blow-pipe, all will be found fully explained. Other text-books may give lengthy accounts of the evolution of dental prosthesis; they may embrace more methods and go into greater detail—none could be more practical in the lessons taught. It abounds with valuable hints; for instance, how ingenious this is to expose the decayed end of a root for crowning which is hidden by gum tissue: Ream out the canal partially, take an ordinary tack, build gutta-percha around its head, heat and press into the canal; then with a burnisher spread the gutta-percha over the end of the root till it passes over the margins. At the next appointment the root will be free to work at. There is an absurdity on page 61, where the crowns of natural teeth are suggested in place of the usual metallic or porcelain article for crowning. This, however, does not prevent the book being a most indispensable one to a student or to one who loves his laboratory.

A COMPEND OF DENTAL PATHOLOGY AND DENTAL MEDICINE containing the most noteworthy points upon the subjects of interest to the dental student, by Geo. W. Warren, D. D. S., Clinical Chief, Penn. College of Dental Surgery. Illustrated. Philadelphia, P. Blakiston, Son & Co., No. 1012 Walnut St. 1890.

This is No. 13 of the handy series of quiz-compendes designed principally for the use of students in medical colleges. The author of this one understands very well what is needed, and sets forth his matter in concise and unmistakable words. It will do any practitioner, teacher or pupil good to read every one of his well digested paragraphs. It is best adapted, however, to the needs of medical students and cannot fail of doing much good. The advice about tooth extraction is abreast of modern thought and will have an excellent effect.

The part of the book devoted to medicines, which would give it most value to dentists is rather deficient, probably because it is not really intended for them. This is made prominent by the fact that neither disinfectants nor antiseptics, the two most used agents in the dental pharmacopœia are not included in his classification, although of course their properties and their uses are mentioned as belonging to some of the drugs described. It is a book, however, well calculated to instruct, and will be of special benefit to college students in refreshing the memory, which is the real purpose of all of the series to which it belongs.

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#### THE ARTIC ESKIMO.

EXTRACT FROM ETHNOGRAPHICAL MEMORANDA BY JOHN W. KELLY.

\* \* \*

Among the coast people the nose is broad and flat, with very little or no ridge between the eyes. The adult males have short mustaches, and some of the elder ones (more noticeable in the interior) have rough scraggy beards. Generally their beard is very scant and most of them devote otherwise idle hours to pulling out the hairs. All have good teeth, but they are subjected to severe usage, being used for pincers, vises, and fluting-machines. The teeth are employed in drawing bolts, untying knots, holding the mouth-piece of a drill, shaping boot-soles, stretching and tanning skins. When they become uneven from hard usage they are levelled off with a file or a whetstone. A woman at the age of

forty who has done her share of the house-work generally has her front teeth worn down so low that they are useless for mechanical purposes.

At any time from sixteen to twenty-two years of age the male natives have their lower lips pierced under each corner of the mouth for labrets. When the incision is first made, sharp-pointed pieces of ivory are put in. After the wound heals the hole is gradually stretched to half an inch in diameter. Some of the poorer natives wear labrets made from cannel coal, ivory, common gravel, and glass stoppers obtained from ships which they shape for the purpose. All who can obtain them have agate ones. One labret is nearly always plain, and shaped like a plug hat, with the rim inside the mouth to hold it in; the other has a white washer an inch and a half in diameter just outside the lip, held in place by a nut of turquoise fastened to the end of the labret by petroleum pitch from Icy Reef or spruce gum from the Nooatok. It is not known where they have obtained the turquoise or the porcelain-like washer. The natives say they have always been in the country, and have been handed down by successive generations. Some of the old men who have made a good record as whalers tattoo their cheeks; some of the designs are triangular, an inch long, with one point intersecting the corner of the mouth. Another kind is a rectangular bar an inch and a half long, extending from the corners of the mouth toward the ears.

\* \* \*

In treating rheumatism, swellings from fractures, or syphilis, in addition to the incantations they fearlessly use a knife in lancing, always cutting into the part affected, where they insert a goose-quill to let out blood or pus. They cut deep without regarding the state of the wound or whether it is ready to be lanced or not. Using no anæsthetic and carving deliberately with a knife not remarkable for its sharpness the patient endures the most intense agony, his screams being heard all over a village.

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BOOKS RECEIVED.

THE LATIN GRAMMAR OF PHARMACY AND MEDICINE. By D. H. Robinson, Ph. D., Professor of Latin Language and Literature, University of Kansas; with an Introduction by L. E. Sayre, P.h G., Philadelphia. P. Blakiston, Son & Co., 1890. Price, cloth, \$2.



## PAMPHLETS RECEIVED.

TRANSACTIONS OF THE INDIANA STATE DENTAL ASSOCIATION. Thirty-second Annual Meeting, held at Lake Maxinkuckee, Indiana, June 24-27, 1890. Published for the Association. Indianapolis, 1890.

ENGLISH-ESKIMO AND ESKIMO-ENGLISH VOCABULARY. Compiled by Ensign Roger Wells, Jr., U. S. N., and Interpreter, John W. Kelly. Washington Government Printing Office, 1890.

HISTORY OF EDUCATION IN ALABAMA, 1702-1889. By Willis G. Clark. Washington Government Printing Office, 1890.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION. Thirtieth Annual Meeting, Excelsior Springs, Mo. Geo. H. Cushing, Secretary, Chicago. H. D. Justi, 1890. Price, \$1.

TRANSACTIONS OF THE MISSISSIPPI STATE DENTAL ASSOCIATION. Sixteenth annual session. Vicksburg, Miss., 1890.

TENTH ANNUAL REPORT OF THE ILLINOIS STATE BOARD OF HEALTH; with an appendix embracing Coroners' inquests, meteorological tables, Illinois Army Board of Medical Examiners, and official register of physicians and midwives. Springfield, Ill. J. H. Rauch, M. D., Secretary, 1890.

ON THE AGENCY OF MICRO-ORGANISMS IN CARIES OF THE TEETH. By J. Howard Mummary, M. R. C. S. L. D. S. Eng., read before the International Medical Congress, held in Berlin, August, 1890, and reprinted from the *Journal of the Dental British Association* for September and October, 1890.

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DENTAL COLLEGE COMMENCEMENTS.

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UNIVERSITY OF CALIFORNIA, COLLEGE OF DENTISTRY — NINTH ANNUAL COMMENCEMENT.

The degree of Doctor of Dental Surgery was conferred on the following, by Martin Kellogg, A. M., President pro tem, of the University:

Frederick Harrison Allbright.  
 Gotthard Sigismund Backman.  
 Frank Drake Burleson.  
 Paul Charles Erhardt.  
 William T. Heider.  
 Charles Alexis Herrick.  
 Saul Robert Jacobs.  
 Charles Ashby Litton.

Walter Romain Lovegrove.  
 George Martin.  
 Richard McCarger.  
 John Matthew Redmond.  
 David Warren Rulison.  
 William Fuller Sharp.  
 Albert John Sylvester.  
 Clark Harrison Rawson.

## PRACTICAL NOTES.

## WHITTILING A WEDGE.

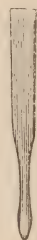
BY LOUIS OTTOFY, CHICAGO.

The whittling of a wedge seems so simple that one would think everybody knows how to do it. The other day I was standing at the chair of a dentist while he was in the act of filling two cavities on the anterior approximal surfaces of the upper central incisors. The cavities were small, the teeth slightly lapping, and the previous separation resulted in producing somewhat less than the necessary space for comfortable manipulation. Forcing the gold into the cavities, either by hand pressure or the mallet, caused the teeth to move, and the wedge, which was whittled to a sharp point in the form of an actual wedge, kept continually coming out.

Annoying the operator and finally compelling him to hold the wedge down with the thumb, thus getting his hand in the light and way, considerably hampering him. The sharp point to which the orange wood was whittled had finally perforated the rubber dam, and midst the constant remonstrances of the ob-



The wrong way.



The right way.

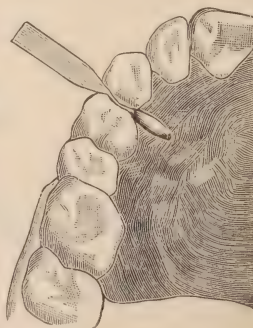
streperous wedge and the possibility of a deluge of saliva coming in through the little holes made by the prick of the wedge, the operation was finally completed.

The wedge should not be short, chubby, thick and pointed; but long, slender, thin and obtuse at the end, which really aids in holding back the rubber dam on the lingual surface. By so whittling it that it is narrow at the point, then

becomes wider and then slightly narrower again, then by pressing it in until the wider portion has passed the point of the nearest contact of the teeth, the wedge becomes so locked in as to be almost immovable, and



The wrong Way.



The right way.

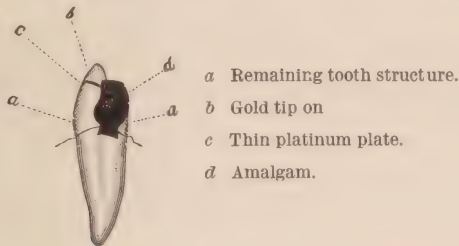
will generally remain so, even during the in and out drawing of sandpaper strips while polishing.

### A METHOD OF SAVING WEAK WALLS OF BICUSPIDS WHICH HAVE BEEN USUALLY SACRIFICED FOR CROWNS.

BY GARRETT NEWKIRK, M. D., CHICAGO.

Miss B. had a right superior first bicuspid with nothing of the crown remaining except a frail outer wall with cusp and an inner wall barely high enough to support a matrix.

I filled the root canals, leaving the principal part of the pulp chamber to serve as a point of anchorage for the amalgam. Then I cut off the cusp below the line of possible occlusion with the lower teeth, beveling the stump outward. Over the end of the stump and to the cavity wall a piece of thin platinum was burnished. Removing this carefully, I flowed gold upon the upper surface to form a cusp, applied again and reburnished it to the cavity



and edges—solder was then flowed over the face of the platinum to make it rigid, it was then carried to position with thin cement and held firmly till set. A copper band matrix, previously made to fit the tooth, was now applied and filled with amalgam, rather dry, and condensed with the mallet. The matrix was left in position 3 days, it was then removed and the filling and cusp finished with stones, strips and disks.

Result—A natural wall preserved at point of ordinary observation, a gold cusp scarcely noticeable, the form of which supports the wall against fracture; inwardly solid amalgam, except a short piece of the natural wall. The whole promises well for usefulness, perhaps for many years.



## MEMORANDA.

Merry Christmas and a happy New Year.

Prof. L. Warnekros is engaged in writing a new book.

Dr. Calvin Bradley, of Dayton, Ohio, died November 3, 1890.

What has become of the "Transactions of the First International Dental Congress?"

Mississippi Valley Dental Society will meet in Cincinnati, Ohio, the first Wednesday in March, 1891.

Dr. John H. Spaulding, since October 15, 1890, is located at 36 bis, Avenue de l'Opera, Paris, France.

When this you read remember—your subscription has expired for 1890. Renew for 1891. Volume V., \$2.50 per annum, you know.

Look out for Catching's Compendium of Practical Dentistry, — — A. D., 1891. If you have not sent in your order, do so at once.

Drs. W. H. Whitslar and N. S. Hoff are the new associate editors of the Dental Register. We extend to them our congratulations.

Dr. W. W. Allport has been confined to his room for about two weeks, but he is out again, having escaped an attack of typhoid fever.

"Uneasy lies the head that wears a crown"—unless the root was perfectly aseptic and thoroughly filled before the crown was attached.

Even during the pendency of a heated election campaign a dentist is justified in demanding pay for services on the stump.—*Boston Transcript*.

So far we have received but three answers to our appeal for forms of statements of account or billheads, as they say in commercial circles.

Dr. J. E. Cravens, formerly of Indianapolis, has associated himself in the practice of dentistry with Dr. John W. Crane, at 41 Boulevard des Capucines, Paris, France.

Dr. J. E. Cravens has a very interesting letter from Paris, in the "Transactions of the Indiana State Dental Association for 1890." Copies may be had on application to Mrs. W. M. Herriott, Indianapolis, Ind.

New life has again been fanned into the Ohio State Dental Society by the election of "Salamagundi" E. G. Betty, D. D. S., to the presidency. We look for a rousing old time meeting when he wields the gavel in 1891.

Dr. B. J. Bing, of Paris, France, has built an operating room next door to his suite of apartments in the Rue Cambon for a clinic. He says: "A chair in which will be at the disposal of any *bona fide* dentist or surgeon visiting Europe."

Some one has dishonestly appropriated 1200 artificial teeth from the Dental Depot of C. Ash and Sons of Berlin. Any members of the profession to whom teeth are offered at any reduction from the regular price are requested to notify the firm.

It is fallacious to expect copper amalgam fillings to be as perfect when introduced under moisture as when they are introduced in the usual manner, carefully excluding the moisture. If the copper amalgam is of the proper consistence, (not

too soft) it will flake and particles will break away from around the margins if introduced under moisture, hence, whenever it is possible care should be taken to keep the cavity dry.

At the meeting of the Hayden Dental Society of Chicago, held Nov. 17, 1890, Dr. C. H. Robinson, of Wabasha, Minn., read a paper on Incidents of Practice. The next meeting will be held December 15, 1890, when Dr. A. J. Oakey will read a paper on "Teething."

At the annual meeting of the Odontological Society of Chicago, the following officers were elected: President, F. H. Gardiner; Vice-President, W. B. Ames; Secretary, Edmund Noyes; Curator of Museum, Garrett Newkirk. The retiring President, P. J. Kester, delivered the annual address.

Dr. E. B. Ward, late professor of dental pathology in the Chicago College of Dental Surgery, has been compelled, on account of ill health, to resign his position and remove to a more southerly climate. Dr. Ward has located for the present near Richmond, Virginia, where we hope to learn of his speedy recovery to health.

Last month a contributor suggested the use of tracing cloth for polishing strips. A. M. Yorke, who is a student in the Chicago College of Dental Surgery, has used the same thing for some time, and suggests to dentists as a matter of economy to use that which is found between the sheets of pink rubber sold at the Dental Depots.

Bombay, India, offers a great field for the enterprising dentists who desire to make a special study of rhinoplasty, as a recent newspaper report says that cutting off the nose of an enemy, or a faithless wife, is a favorite act of vengeance in that district, and simultaneously with the practice has grown the art of making new noses to replace those sliced away.

We believe there is not a single dental athletic club in the United States. Would it not be a good idea to establish one in New York, Boston, Philadelphia, Chicago and a few other cities where the population would warrant such an undertaking? Any suggestions of this kind if addressed to Dr. J. W. Wassall, 208 Dearborn Avenue, will receive prompt attention.

A medical man in England recently sued a retired physician for his fee and got it. The code of ethics is silent on this point. It is generally presumed that one physician will be sufficiently courteous to another to not demand a fee for services. How is it with dentists? We always pay the doctor when he is called, and he—well sometimes he pays and at others he does not. Will *you* please tell us how you practice in this matter?

There is a dentist in our city who follows the profession more from necessity than from choice. He sacrificed a leg to the country's cause, and, being obliged to wear a cork substitute, he studied dentistry as a business calculated to fit his misfortune—no walking and good money in it. Now, this man, be it said with sorrow, looks all too frequently upon the wine when it is red, and when loaded with the cup that cheers, this cork leg is most unruly. He reached home one night recently in a very bemuddled condition. Upon seeing his wife's worried face and hearing her expostulatory voice, he flew into a rage and—took off that cork leg and threw it at her! Lady friends of the wife who have admired a magnificent

new mirror just placed in the pleasant home will understand from this that he missed the target and the cork missile went crashing through a full-length looking-glass. He has been sober, very sober, ever since.—*Exchange*.

The Chicago Anæsthetic Club is doing excellent work from all accounts, in spreading a knowledge of the properties and uses of the various anæsthetic agents. A correct knowledge of the proper methods of administering agents of this class should be more generally diffused, and our readers will do well to attend the meetings of the club the first Thursday evening of each month, at the Grand Pacific club room at 8 P. M. B. J. Cigrand, D. D. S., is the energetic secretary, to whom all communications should be addressed.

In view of the threatened dearth of India-rubber and the rapid decimation which is going on in the available gutta-percha trees, the statement that a supply of what may, in some respects, be an effective substitute for these useful articles of commerce is plentiful in Australia, is of interest. The Australian caoutchouc is said to have been first observed in little sand hollows, and resembled patches of dried leather. It was found generally in swamps, and the theory of its production was that it had resulted from the overflow of petroleum or rock oil. There is still a wide difference of opinion as to the origin of the substance. Some scientific authorities ascribe to it a vegetable origin and regard it as a gum exuding from a plant or lichen. Others assign to it a subterranean origin, but the known facts concerning it are not corroborative of this view.

#### NO CREDIT HERE.

Sufferer—"I see you advertise teeth extracted without pay'n."

Dentist—"So I do, but yours will cost you a quarter each."—*The People*.

#### A SUMMER IDYL.

People are occupying very few clothes elsewhere just now. By the way that reminds me—if Mary-land wears her New-Jersey, what will Del-a-ware? Having perpetrated this fiendish witticism the signal man on the Atlantic coast retired into his burrow and was lost to sight.—*Exchange*.

#### NORTHERN ILLINOIS DENTAL SOCIETY.

The officers elected were: President, M. L. Hanaford, Rockford; Vice-President, G. B. Dillon, Sterling; Secretary, T. W. Beckwith, Sterling; Treasurer, A. B. Elmer, Rochelle. Executive Committee: Chairman, E. J. Perry, Chicago; E. R. Warner, Morrison; H. R. Staley, Lanark. Meets next year at Elgin.

#### AMERICAN DENTAL CLUB IN PARIS.

The above club was founded some time ago, with the following officers: President, Thomas W. Evans, M. D.; Vice-President, Charles Kingsley, M. D. S.; Secretary, G. C. Daboll, M. D. S.; Treasurer, Dr. Barrett; Corresponding Secretary, J. E. Cravens, D. D. S. Members of the Executive Committee, Drs. E. A. Bogue and M. M. Levett. Messrs. Brigiotti, Crane, Davenport, Da Sylva, Victor and F. Du Bouchet, T. Evans, Hugenschmidt, Michaels, Rost, Spaulding, Wilkie Woodward and others, are members.

#### HEADACHES FROM THE EYES.

Among obscure causes of severe and obstinate headaches that physicians have been investigating lately are defects of the eye. In one class of cases the headache is traceable directly to the use of the eyes and is accompanied by such



symptoms as weak feeling, watering, strained sensation, and inability to use them for any length of time. In another class of cases the cause of the headache is by no means evident, as the vision is apparently perfect, and the eyes themselves are free from pain, and generally the oculist is called in only as a last resort, after all other attempts to cure the headache have failed.

#### TEETH ALL EXTRACTED AT 20.

The following is a genuine letter addressed to an oral surgeon in Chicago, who handed it to us for publication :

*Dr. ———, Chicago:*

DEAR SIR—Five weeks ago I had every tooth in my head extracted. I was told by the dentist that it was the only thing he could do for me, but I have since learned that I might have had the larger part crowned. But they are out now to my life-long regret, I am afraid.

I am very young (20 years), and although I succeed as well as any one with plates, it breaks my heart to wear them. I have consulted every dentist here in regard to whether or not it would be practicable to transplant other teeth for me, but they all fear to try so many at once, being afraid of ulceration. But one and all referred me to you as being the most advanced on transplanting and other theories.

Now, what I want to do, is to run down to Chicago and have you transplant a full upper and lower set of teeth for me, providing it does not cost too much.

My gums are in a good, healthy condition and about one-half reduced. I hope you can give me a reasonable amount of encouragement, as it is the only resort I know of excepting plates. Please let me know my fate as early as possible.

Yours truly, ———.

P. S. If I cannot have all transplanted, perhaps I could have just the front ones. I am willing to take considerable risk if you are not positive of success. I would rather have good teeth than good clothes. It is the only disease I am troubled with, I having hardly known a sick day.

We clip the following from one of our exchanges and ask the attention of our readers to the subject :

#### CANCER.

All statistics on the subject indicate unmistakably that cancer is a disease of increasing frequency, and the increase is, in all probability, due to the greater pressure on the nerves caused by modern conditions of life. This increase of a disease which is peculiarly dreaded, has attracted continual attention in the United States, as well as in Great Britain. Dr. H. Snow, surgeon of the London Cancer Hospital, states in an article in the *Nineteenth Century*, that the number of deaths from cancer in England has risen from 385 to 610 per million. In Ireland in 1864, with a population of 5,675,307, there were 1,498 deaths from cancer; but twenty years later, in 1884, when the population had fallen to 4,962,693, the number of deaths from cancer had risen to 1,947. Dr. Snow believes that cancer is due to nervous causes in the cases where direct injury can be excluded. He says: "It is found that of the last 250 female patients admitted with the special forms of cancer referred to, 43 gave some grounds for the suspicion of mechanical injury as the direct excitant; of whom, however, 15 described themselves as having undergone much previous distress and anxiety in the period immediately

preceding the appearance of the new growth. In 19 no obvious cause was apparent; 32 gave a history of specially laborious occupations, of hard work and privation; while in 156, or 62 per cent an account of immediately antecedent mental trouble (to the exclusion of every other possible factor), often in very poignant and unmistakable form, was ascertained, on a necessarily somewhat cursory investigation.—*Ex.*

Can the terrors of the dental chair have any part in causing this dread disease? We ask the profession to carefully investigate and send us any reports they may make regarding this theory.

#### ACCIDENTS IN ANÆSTHESIA.

According to Dr. H. C. Wood, of Philadelphia, the rules for the proper treatment of accidents during anæsthesia can be summed up in a very few words:

Avoid the use of all drugs, except strychnine, digitalis, and ammonia.

Give the tincture of digitalis hypodermically.

Draw out the tongue, and raise up the angle of the jaw, and see that the respiration is not mechanically impeded.

Invert the patient briefly and temporarily.

Use forced artificial respiration promptly, and in protracted cases employ external warmth and stimulation of the surface by the dry electeic brush, etc.; and, above all, remember that some, at least, and probably many, of the deaths which have been set down as due to chloroform and ether have been produced by the alcohol which has been given for the relief of the patient.—*Jour. Am. Med. Assn.*

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## OBITUARY.

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#### DR. THEODORE S. EVANS.

Dr. Theodore S. Evans, a brother of the noted specialist, Dr. Thomas W. Evans, died in Paris, France, in the latter part of November. The funeral took place December 2nd, services being held in the American Church of the Holy Trinity, the Bishop of Minnesota officiating. Among those who attended the funeral were the members of the American Legation.

#### JOSEPH RICHARDSON, D. D. S., M. D.

Dr. J. Richardson, the eminent author, died at his home in Terre Haute, Indiana, recently, much to the surprise and regret of his professional associates. We will shortly publish a sketch of his life, meanwhile we tender to his bereaved family our warmest sympathy in their affliction.

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